YAMAHA

SYNTH GUIDE

Content

Introduction 2

Part 1)
Synthesizers and Workstations 3

Part 2)
10 years of MOTIF - from „Classic“ to „XF“ 7

Part 3)
MOTIF Basics 14

Part 4)
MOTIF sound architecture and controls 20

Part 5)
MOTIF control section 25

Part 6)
The Voice-Mode 30

Part 7)
Expanded Articulation and Mega Voices 35

Part 8)
The Performance Mode 41

Part 9)
The Song Mode 46

The Authors 50

INTRODUCTION

The Synth Guide is a workshop series that introduces the basic concepts of synthesizers and workstations with special reference to the Yamaha MOTIF series. A special feature of the MOTIF series is the continuity in the sound architecture and operation. So if you have once understood the device's concept you can apply this knowledge on the following models.

The following devices are primarily considered:

- MOTIF XF
- MOTIF XS
- MOX
- MOTIF-RACK XS
- S90 XS

However, owners of older models such as the MOTIF „Classic" or the MOTIF ES can also benefit from this workshop series, since, as stated above, the basic sound architecture is unchanged throughout the complete MOTIF series (including S-and MO-series).

This Synth Guide contains all parts which were released between the years 2011 and 2013 in the MUSIC PRODUCTION GUIDE.

The MUSIC PRODUCTION GUIDE is the official News Guide from Yamaha & EASY SOUNDS for Yamaha Music Production Instruments.

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PART 1: SYNTHESIZERS AND WORKSTATIONS

For the past 20 years, Yamaha releases free Quick Guides to their respective new synthesizers, tone generators, and workstations.

For several years, the Quick Guides are integral parts of the Music Production Guides (until August 2010 „MOTIF News Guide“).

Since those guides and workshops were mostly based on a specific model, we will try and start a new concept in this series.

Ten years ago, the first synthesizer of the very popular MOTIF series was introduced. With the MOTIF 6 / 7 / 8 (or MOTIF „Classic“) began a success story that was most recently continued with the MOTIF XF models and the MOX.

A special feature of the MOTIF series is the continuity in its sound architecture and operation. So if you have once understood the device's concept you can apply this knowledge on the following models.

Considering this we had the idea of a universal „Yamaha Synth Guide“, which covers all eligible topics in a series and one by one.

The following devices are primarily considered:

- *MOTIF XF*
- *MOTIF XS*
- *MOX*
- *MOTIF-RACK XS*
- *S90 XS*

However, owners of older models such as the MOTIF „Classic“ or the MOTIF ES can also benefit from this workshop series, since, as stated above, the basic sound architecture is unchanged throughout the complete MOTIF series (including S-and MO-series).

The workshop also wants to enable newcomers to the world of the MOTIF series to step beyond the basic operation. One goal is to use the enormous potential of the instruments and to optimize the workflow.

Let's start with some basic definitions. The variety of instruments that are played with a keyboard is very broad. The question is: What is a „keyboard“, what is a „workstation“? Where does a „stage piano“ begin, at which point is the term „master keyboard“ no longer applicable? What is referred as „analog“ or „digital“? What instrument is called „ROMpler“ (Wave-ROM player) and how does it differ from a synthesizer? There are many questions like these - we want to bring some clarity to the confusion.

THE SYNTHESIZER

For centuries the sound generation of musical instruments based on natural materials, such as wood, metal, natural furs, skins, or gut. The extended possibilities of an alternative sound generation arose with the electricity. Robert Moog is regarded as a pioneer and inventor of the first synthesizer, having constructed the first electronic analog synthesizer in the mid-sixties of the last century.

A trip into the detailed distinction between analog and digital technology would at this point deviate too far from the real issue. So - at the time of the first synthesizer the analog technology was the only available. Analog technology results in almost infinitely variable signals. In contrast, the signal of the digital technology is always divided into steps, each representing a fixed value of the total possible value range.

The Minimoog was one of the most popular and successful models of synth history

The first synthesizers were monophonic only, meaning they could always produce only one tone at a time. They were also built modularily. The sound generation was done by at least one oscillator, additional modules for the modulation of the sound were such as filters and envelope generators. All these terms are currently in our technical language, too. We will return to these in detail later.

The distinction between analog and digital not only occurs in the signal generation, but also in the operation of electronic musical instruments. Traditional synthesizers from the early days were operated analogous. They had rotary or sliding controls (potentiometers) to alter values, the modules were connected using cables. Modern digital equipment operation can be done with the help of push buttons to change values, and knobs and faders work digitally, allowing changes within the given value range only at fixed levels. However, today, every hybrid is possible. There are units with a combination of sound generation to operation in all variants: Analog/analog, digital/digital, analog/digital, and digital/analog.

Going back to history. A major advance was the polyphony. The „Polymoog" had six voices and no longer consisted of modules. But it was not affordable for the „average musician" from a house with average income. In a price list from the early 80s the instrument was listed with about 16.000 DM (sorry, I can't figure the equivalent in your whatever currency in the early 80s. In 1982 one US-Dollar was worth about 2,40 Deutschmark. However, a new car like the middle class Mercedes Benz 190 or W201 costed about 26.000 DM in 1982).

A milestone in the development of the polyphonic synthesizer was the Yamaha CS-80, which came on the market in 1977. Unlike the Polymoog or other polyphonic synthesizers from this time, the CS80 no longer based on organ technology.

„The sound engine of the CS80 based on the analog subtractive synthesis, its 16 oscillators could generate two independent sounds with eight voices each, which then could be mixed. The other sound shaping was done by a resonant envelope-controlled high- and low-pass filter (12dB/octave), a LFO (sine, sawtooth) and a ring modulator ... „

(translated from: http://de.wikipedia.org/wiki/Yamaha_CS-80)

Thanks to the almost unlimited availability of media and information any interested reader can find much more comprehensive information about the development of electronic instruments and different forms of synthesis.

For we want to make a time jump to the here and now. What is it that justifies the term „synthesizer"? To get to the point: A very clear line can barely be drawn.

Let us first consider the core of the question: the basis of sound generation. Before the era of sampling the sound of every synthesizer was produced by at least one oscillator. Today the vast majority of sound generation is based on samples.

Now, a sample - in contrast to an oscillator - can already include all possible modulations and effects etc. So a machine that plays back ready-made samples is sufficient to generate sound. Such equipment is called a sample player, ROM sample player, or in short „Rompler". Only the possibility of actual sound processing, for example using filters, envelopes, LFOs, etc. allows the comparison to the original synthesizer.

Whether the - as an example - sine wave is generated directly from an oscillator or is the result of playing back a sample can be neglected at least for the terminology. It is obvious that a saxophone sample should in principle sound like a saxophone without any processing. But it is this sample that may result in sounds, that can't be achieved with a traditional oscillator (or only with much effort), if it is processed by the modulation capabilities of a synthesizer.

Keeping that in mind we can make absolutely clear that the sound generation in each of the instruments discussed in this workshop series can definitely be called a synthesizer.

A closer look at the Yamaha editor software shows the vast variety of parameters that each of the up to eight Parts (similar to oscillators) within a Voice offers to process and modulate a signal. Both the presets as well as the „sample-free" versions of optional soundsets include plenty of great examples.

The ability to play 16 Voices in parallel has not necessarily to be used as a multi-mode for working with MIDI files. It can also be used to create extremely complex sounds with - to express it traditionally - up to 128 oscillators. I'm not sure if Mr. Moog has dared to have this vision at his time.

So the preliminary summary is: Every instrument from the MOTIF / S / MO / MOX series includes a full-fledged synthesizer.

THE WORKSTATION AND SAMPLING

Taken literally, one might translate the term workstation to perhaps as a „machine doing the main workload". If you enter the term in Wikipedia, you get the explanation of a powerful computer system.

Strictly speaking the workstation for us musicians is both. Modern electronic instruments are specialized computers that are restricted to musical applications. They become a „machine" by the enhancing combination of applications that go beyond just playing sounds. In principle, one can see it again as a modular system, only within a single unit.

An important component which elevates a synthesizer to a workstation is a recording and playback ability. So a built-in sequencer has probably the widest distribution for that purpose.

The MOTIF XF is the current top model of the MOTIF-series

In earlier times generally available as a standalone device, the sequencer is used in a workstation for recording and editing your own performance and playing back pre-produced audio or MIDI data.

A workstation's sequencer can record multiple tracks, extensively edit the recorded data, delete or add individual data, resolve the recordings in pattern or song structures and much more. Even the integration of audio data is possible.

The latter leads us to another option of the workstation: sampling.

Samplers were also separate devices in the past. They were used for recording, editing and playing back audio data, but not in the style of a tape recorder. The audio data was cut into small individual samples, then edited and prepared to be played with a keyboard or the pads of a drum machine.

For the proper processing of the recorded audio data (graphical representation of the waveforms) the first samplers had their own monitors or at least a monitor connector. Many modern workstations, including the MOTIF series from „classic" to XF, feature a full-fledged sampler, which can perform all necessary edits directly on the instrument.

Additional options of a workstation - but not limited to - can be master keyboard functions, that make it possible to control multiple instruments and expanders from a single keyboard.

The remote control of a computer software such as Cubase can be part of a workstation, too. (A brief glance here: Softwares such as Cubase, Logic, Ableton Live, ProTools and many more are often referred to as a DAW = „Digital Audio Workstation" - so here's this term, too.)

THE SOUND MODULE

This term is mostly used for the keyboardless versions of a synthesizer, sampler, or even a workstation. Only the development of the MIDI protocol, including its interface, made it possible to „outsource" the tone generation of an electronic instrument into a separate unit. A good example is the milestone-synthesizer Yamaha DX7.

Published in 1983, the Yamaha DX7 turned the synthesizer world upside down and even pushed legends like Moog synthesizers or Oberheim to the background

Some time after the introduction of the DX7 in 1983 the TX-816 was introduced, being a 19" expander, which could accommodate up to eight TF-1 modules. Each of these modules corresponded to the full tone generation of a DX7. However, this system was not available for those with a small budget. The first expander sound modules were in their majority determined on a particular instrument. For example there were expanders used exclusively for piano, organ, or drum sounds. Only in the course of time many keyboard versions were offered in a 19" rack version, too.

A typical application of sound modules has been playing back standard MIDI files of different formats, like GM, GS, and XG. For Yamaha's advanced XG standard, there were some models of the MU series. The most current sound module covered with this guide is the MOTIF-RACK XS.

As already indicated, the diversity of the electronic musical instruments currently on the market rarely allows an unambiguous classification. In some contexts, for example the term „keyboard" alone means the arranger or entertainer keyboard. There are of course some „hybrids", like arranger workstations, stage pianos, performance synthesizer, home keyboards. There is no end in sight.

For the instruments with which we want to deal in this workshop, in any case the term synthesizer shall fit.

Apart from the MOTIF-RACK XS the term workstation is applicable, too.

COMING NEXT

In the next part of this workshop series we will discuss the history of the MOTIF series. In addition to describing the development from the MOTIF „Classic" to the XF, we will also discuss the compatibility of the devices with each other and give advice on upgrading.

PART 2: 10 YEARS OF MOTIF – FROM THE „CLASSIC" TO THE „XF"

In this episode we will discuss the history of the MOTIF series, which celebrates its 10th anniversary.

In addition to the description of the development from the MOTIF „Classic" to the „XF", associated with a list of the relevant features, we also will discuss the compatibility of the instruments with each other and give tips on upgrading.

MOTIF 6 / 7 / 8 („MOTIF CLASSIC")

- *61 / 76 / 88 keys*
- *62 notes of polyphony*
- *84MB Wave-ROM (when converted to 16-bit linear format)*
- *1,309 Waveforms*
- *384 Preset Voices, 48 Preset Drum-Kits, 1 GM Drum-Kit*
- *128 User Voices, 8 User Drum-Kits*
- *128 Performances, 128 Masters*
- *64 Songs / 64 Patterns*
- *MIDI Sequencer capacity: 110,000 notes*
- *256 Preset Arpeggio Patterns, 128 User Arpeggios*
- *4MB built-in sample memory, expandable to 64MB with SIMMs*

The MOTIF Classic was introduced in 2001 to the market and uses - like all models of the MOTIF series - the AWM2 technology, in which sampled Waveforms are processed using the principle of subtractive synthesis with envelopes, filters and LFOs. This soundprocessing is applied to the ROM Waveforms as well as the User Waveforms (samples).

For storing user data (Voices, Performances, Songs, Patterns, Samples, Arpeggios) the MOTIF Classic uses SmartMedia cards, which were available in capacities from 8 to 64 MB. Compared to the floppy drives of earlier devices these were impressive memory sizes.

An outstanding feature is the Song / Pattern recording concept of the MOTIF. MIDI and audio recordings are be combined by the Integrated Sampling in innovative ways. Samples can be directly recorded in the Song or Pattern mode and used as Sample Voices. These have the same processing options as „normal" Voices in the Mixing mode.

The sampling type Slice + Sequence allows loops or phrases to be played back with variable speed or to process sections of the recording („slices") with filters, envelopes and effects, which can result in significant changes in the audio material.

Integrated Sampling means that samples can be directly integrated in all modes. Immediately after the sampling process, the sample is playable in the desired mode without having to program Waveforms, Voices or Performances. The Integrated Sampling mode is a sub-mode of the Voice / Performance / Song / Pattern mode.

The Pattern mode offers the very popular recording method using Patterns, which was already implemented in the Yamaha QS300 or the sequencers of the QY series and was further developed for the use in the MOTIF. The Pattern mode offers the same options as the Song mode. There are 16 Tracks available, which are assigned with Voices or Sample Voices.

In addition up to 16 Sections (A - P) can be formed, which together make up a Style. These Sections can be used to freely arrange a song or for those traditional sections of a song like intro, verse, chorus, bridge, fills, end etc.

The multi-settings for Songs and Patterns can be found in the Mixing mode, which is only available from the Song or Pattern mode. Each Song and each Pattern has its own Mixing settings that are invoked along with the Song or Pattern. The most important Mixing settings like volume, panning and effect sends can be set from the Play screen.

Other parameters are available in the Mixing Edit mode.

Another top feature of the MOTIF Classic - as well as of all of the derived models - is the continuously enhanced Arpeggiator. The Arpeggiator is available in all modes of the MOTIF. Arpeggios can thus be integrated into Songs and Patterns.

The sound generation of the MOTIF Classic can be expanded with optional plug-in boards, which are based on different synthesis like Analog Physical Modeling (AN) or Frequency Modulation (DX).

MOTIF ES 6 / 7 / 8

- *61 / 76 / 88 keys*
- *128 notes of polyphony*
- *175MB of Wave-ROM (when converted to 16-bit linear format)*
- *1,859 Waveforms*
- *768 Preset Voices, 64 Preset Drum-Kits, 1 GM Drum-Kit*
- *384 User Voices, 32 User Drum-Kits*
- *128 Performances, 128 Masters*
- *64 Songs / 64 Patterns*
- *MIDI Sequencer capacity: 226,000 notes*
- *1,787 Preset Arpeggio Patterns, 256 User Arpeggios*
- *Optional sample memory up to 512MB using DIMMs*

The MOTIF ES was launched in 2003 and offered significant improvements over the MOTIF Classic in many areas, such as:

- *Expanded Wave-ROM*
- *Additional Voice Banks*
- *Extended Polyphony*
- *MegaVoice technology*
- *Advanced Arpeggiator*
- *New effects*
- *New filter chip*
- *Mixing Voices*
- *Song Scenes*
- *Optional sample memory, expandable up to 512MB*
- *Faster loading of samples with SmartMedia card or USB device*
- *Real Time Loop Remix*
- *Advanced Remote Control*

LOADING MOTIF CLASSIC FILES INTO THE MOTIF ES

MOTIF Classic Voices can be loaded into MOTIF ES from the file type „AllVoice“ or „Voice“, using a SmartMedia card, a USB device or the Voice Editor. An automatic conversion takes place here, considering the modified Waveform and Arpeggio assignments.

Although the conversion results are very good overall, in some cases a Voice in the MOTIF ES can sound somewhat different than in the MOTIF Classic.

Imported MOTIF Classic Voices are sometimes considerably enhanced due to the assignment to the new reverb effects, other Waveforms, new Arpeggio Patterns, improved filter characteristics, etc.

Also Waveforms in the format of the MOTIF Classic can be loaded into the MOTIF ES (File Type „AllWaveform“ or „Waveform“).

MOTIF Classic „All“ files that contain Waveforms must first be saved as „AllVoice“ files and can then be loaded into the MOTIF ES.

It is not possible to directly import Songs and Patterns in the MOTIF Classic format.

This would be difficult to achieve, because the Voice Banks on the MOTIF ES were set up from the scratch.

Therefore the only way is to save the MOTIF Classic Song as a Standard MIDI file (File type „SMF“) and then load it into the MOTIF ES as a Song. The Mixing must then be recreated.

It is also not possible to import Performances or Masters of the MOTIF Classic into the MOTIF ES.

Here, the only possibility is a „manual conversion“. The settings have to recreated in the MOTIF ES by hand, using similar Voices in the MOTIF ES.

MOTIF XS 6 / 7 / 8

- 61 / 76 / 88 keys
- 128 notes of polyphony
- 355MB Wave-ROM (when converted to 16-bit linear format)
- 2,670 Waveforms
- 1,024 Preset Voices, 64 Preset Drum-Kits, 1 GM Drum-Kit
- 384 User Voices, 32 User Drum-Kits
- 384 Performances, 128 Masters
- 64 Songs / 64 Patterns
- MIDI Sequencer capacity: 130,000 notes
- 6,000 Preset Arpeggio Patterns, 256 User Arpeggios
- Optional sample memory up to 1GB using DIMMs

The MOTIF XS was published in 2007 and again offered many new features and numerous detail improvements over the MOTIF ES, the most important are:

- *Expanded Wave-ROM*
- *Additional Voice and Performance Banks*
- *8 Elements per Voice*
- *4-part Arpeggiator with re-harmonising*
- *Optional sample memory up to 1 GB (doubled!)*
- *Loading samples is much faster via USB 2.0 connection*
- *Expanded Articulation*
- *VCM effects*
- *Vocoder*
- *Direct Performance Recording*
- *Assignable Switches*
- *Color LC-display*
- *Ethernet data transfer*
- *Optional FireWire (mLAN) connection*
- *Master mode with 8 Zones*

LOADING MOTIF ES AND MOTIF CLASSIC FILES INTO THE MOTIF XS

Voices, Performances, User Waveforms, Sample Voices, User Arpeggios, Songs, and Patterns in the MOTIF ES format can be loaded separately or completely into the MOTIF XS.

So there is a high degree of compatibility between the ES and the XS.

However, the following restrictions have to be considered:

Voices or Performances can sound a little different due to the updated Wave-ROM or modified effect types in the MOTIF XS.

Performances can only be played back correctly if used User Voices are present in the MOTIF XS on the same storage locations.

Thus, if single Performances are imported, possibly related User Voices have to be loaded, too.

The same applies to Songs and Patterns, which can also be reproduced correctly if all Users Voices are also present in the same place in the MOTIF XS. An elegant solution is to store any User Voices in the MOTIF ES as Mixing Voices using the VCE ED function. As Mixing Voices they are automatically loaded along with the Song or Pattern, without the prior User Voices being present.

Using the detour MOTIF ES even MOTIF Classic Voices (including Samples) can be loaded into the MOTIF XS.

To do so, it is necessary to first store the Voices with the file type „AllVoice“ (not „All“) in the MOTIF Classic. Understandably this should be done before any sale of the instrument!

Then the Voices can also be loaded into the MOTIF ES using the file type „AllVoice“ and stored again - this time in the MOTIF ES format. Here you can use either the file type „AllVoice“ or „All“. The files stored with the MOTIF ES can then be easily loaded into the MOTIF XS.

Since the Wave-ROM of the MOTIF XS differs considerably from that of the MOTIF Classic, significant differences in sound can occur.

A direct conversion from the Classic to the XS can only refer to User Voices and Waveforms (samples). All other data such as Songs, Patterns, Performances and Masters are not convertible.

For this purpose the storage structures of the instruments are far too different.

MOTIF XF 6 / 7 / 8

- *61 / 76 / 88 keys*
- *128 notes of polyphony*
- *741MB of Wave-ROM (when converted to 16-bit linear format)*
- *3,977 Waveforms*
- *1,024 Preset Voices, 64 Preset Drum-Kits, a GM Drum-Kit*
- *512 User Voices, 32 User Drum-Kits*
- *512 Performances, 128 Masters*
- *64 Songs / 64 Patterns*
- *MIDI Sequencer Capacity: 130,000 notes*
- *7,881 Preset arpeggio Patterns, 256 User arpeggio*
- *128MB built-in SDRAM sample memory*

As preliminary climax the MOTIF XF was introduced to the market in 2010 - the current top model of the Yamaha synthesizers.

In addition to the doubling of the Wave-ROM the optional expansion with Flash-ROM boards for samples is the outstanding innovation of the MOTIF XF.

Here is an overview of the major new features in comparison to the MOTIF XS:

- *Expanded 741MB Wave-ROM*
- *1,307 new Waveforms*
- *128 new Voices (User 1), based on the new Waveforms*
- *128 new Performances (User 1), based on new Voices and Arpeggios*
- *8 new Drum-Kits, based on the new Waveforms*
- *1,248 new Preset Arpeggios*
- *32 new Masters, based on the new Voices and Performances*
- *„On board“ 128MB SDRAM for samples*
- *Optional Flash-ROM boards for samples (max. 2 x 1GB)*
- *Excellent, flexible sample management with newly designed file-mode*
- *New keyboards for MOTIF XF6, XF7, XF8*
- *User-definable LCD (type and color selection)*
- *Drum-Kit Edit in the Mixing mode for User Drum Voices*
- *Optimized Category Search function*
- *Optimized Arpeggio functions*
- *TAP tempo input*

LOADING MOTIF ES AND MOTIF XS FILES INTO THE MOTIF XF

The MOTIF XF is fully compatible with the MOTIF XS.

All file types can be loaded.

The only limitation is for files that contain samples totaling more than 128MB. These can only be loaded into the optional Flash memory, because the internal SDRAM is limited to 128MB.

Of the data created with the MOTIF ES Voices, Waveforms, and Sample Voices can be loaded into the MOTIF XF.

The MOTIF XF can directly load data from the MOTIF ES using these file types:

- *„all" (all data from the MOTIF ES, W7A)*
- *„all voice" (all User Voice Banks of the MOTIF ES, W7V)*
- *„1 bank voice „ (single User Voice Banks from „all" or „all voice" files)*
- *„voice „ (single Voices from „All" or „All Voice" files)*
- *„performance" (single Performances from „all" or „all voice" files)*
- *„all arpeggio" (User Arpeggios from the MOTIF ES)*
- *„all songs" („all song" file from the MOTIF ES, W7S)*
- *„song" (single Songs from „all" or „all song" file from the MOTIF ES)*
- *„all pattern" („all pattern" file from the MOTIF ES. W7P)*
- *„pattern" (single Patterns from „all" or „all pattern" file from the MOTIF ES)*
- *„all waveform" (all User Waveforms and samples from the MOTIF ES, W7W)*
- *„waveform" (single User Waveforms including samples, W7A, W7W)*
- *„sample voice" (single Sample Voices, W7A, W7S, W7P)*
- *„editor" (Voice Editor files, W7E)*

For all data loaded from the MOTIF ES a full sound compatibility can not be assumed.

In particular there are the following limitations:

The Wave-ROMs of the MOTIF ES and the MOTIF XF are different. Many Waveforms of the MOTIF ES were replaced, resulting in a different sound, however the result can be regarded as superior.

The Preset Voice Banks of the MOTIF ES and the MOTIF XF are composed differently. Therefore, the sound assignments in Performances, Songs, and Patterns will not be consistent, unless User Voices or Mix Voices were used exclusively.

The effect types of the MOTIF ES and the MOTIF XF are clearly different in some cases.

MOTIF-RACK SERIES

The tone generators of the MOTIF-series match the respective keyboard models in terms of basic features:

MOTIF 6 / 7 / 8 „Classic" = MOTIF-RACK

MOTIF ES = MOTIF-RACK ES

MOTIF XS = MOTIF-RACK XS

However, there are some deviations from the features of the keyboard models. The following features are not available:

- *Sampling*
- *Sequencer*
- *Pattern mode*
- *Master mode*
- *Remote Control*
- *SmartMedia card slot and USB TO DEVICE terminal*
- *User Arpeggios*

For the MOTIF-RACK ES and the MOTIF-RACK XS the number of Voices and effects is largely identical to the respective keyboard versions, however, the MOTIF-RACK was already a kind of intermediate step between MOTIF Classic and MOTIF ES.

The MOTIF-RACK has two additional Preset Voice Banks and a second User Voice Bank. In the area of effects it is even superior to the MOTIF Classic, because the new high-quality reverb effects (R3 Hall, Large Hall, Warm Room ...), which were later implemented in the MOTIF ES, are already available in the MOTIF-RACK.

There are also Insert Effects 1 and 2 available for up to four Parts in the Multi mode, while on the MOTIF Classic they were only available for one Part. And a new 3-band Part EQ was added in the RACK version.

It is generally possible to transmit Voices and Multis (Song Mixings) from the keyboard version to the rack module of the same generation. This is done with a bulk dump job via MIDI or with the help of the Yamaha editors.

Of course, this only works with Voices that do not contain samples or User Arpeggios.

The reverse way, meaning the transmission from the rack module to the keyboard version only works for the ES and XS generation, not for the MOTIF Classic.

For the MOTIF ES it has to be considered that the MOTIF-RACK ES features an additional User Voice Bank (User 3). Voices of that Bank have to be previously copied to User 1 or 2 before transmissing them to the MOTIF ES.

Sometimes Voices can also be exchanged „across generations". Voices of the MOTIF Classic for example can be loaded into the MOTIF-RACK ES Voice Editor and then transferred to the MOTIF-RACK ES. The MOTIF-RACK XS Editor can load files in MOTIF XS / ES / MO format.

It is beyond the scope of this article to show all converting possibilities between the instruments of the MOTIF series. The possibilities can best be determined with the respective editors.

First, check which options are available at the bottom (Enable) of „File - Load".

If you can't find the format you want, you can still try File - Import, because sometimes additional Voice import formats are available here.

You can download all the editors of the MOTIF series from::

http://www.yamahasynth.com/downloads/drivers_software/

MO AND MOX

In addition to the top models of each MOTIF generation, there are also reasonably priced „lite" versions, which are especially suited for beginners.

The MO6 / MO8, introduced in the year 2006, is the „lite" version of the MOTIF ES.

Compared to the MOTIF ES the MO6 / MO8 has the following restrictions:

- *No sampling*
- *No plug-in boards*
- *Only one connector for foot controller and foot switch*
- *No breath control connector*
- *No audio input*
- *No assignable outputs*
- *Only three Insert Effect Blocks (instead of eight in the MOTIF ES)*
- *Only four Preset Voice Banks (instead of six in the MOTIF ES)*
- *No SmartMedia card slot*

MOTIF ES and MO6 / MO8 are largely compatible. Voices can be shared with the file type „AllVoice“ or with the editors.

Restrictions on sound compatibility arise primarily from two factors:

- *Insertion Effect Blocks*
  The MOTIF ES has eight Insert Effects Blocks, the MO only three. In a MOTIF ES Song or Pattern Mixing thus up to eight Parts can have their own Insert Effects A + B. On the MO a maximum of three Parts can have exclusive Insert Effects
- *Voice Banks*
  The compilation of the Voice Banks on the MOTIF ES is different from the Banks on the MO6 / MO8.
  The MOTIF ES has six Preset Voice Banks, two User Voice Banks and one GM bank.
  The MO has four Preset Voice Banks, two User Voice Banks and one GM bank.

It‘s only a few months ago that the MOX6 / MOX8 was launched, so it is the latest instrument of the MOTIF-series. The MOX can be regarded as a „lite“ version of the MOTIF XS with various advanced features.

Compared to five years older MO6 / MO8 the MOX has a significant increase in features:

- *New, high quality keyboard*
- *Redesigned user interface*
- *Professional sound quality of the MOTIF XS*
- *Wave-ROM extended from 175MB to 355MB (16-bit linear)*
- *811 new Preset Waveforms*
- *Four additional Preset Voice Banks*
- *An additional User Voice Bank*
- *Expanded Articulation*
- *62 new types of effects*
- *5,000 new Preset Arpeggios*
- *4-Part Arpeggiator*
- *Six Arpeggio variations (ARP1 - ARP6) on SF-keys available*
- *Assignable Functions*
- *Built-in MIDI / USB audio interface with DAW level control*
- *Audio Input (A / D input)*
- *Level Meter - Switchable between A/D input and Mix*
- *Performance Creator*
- *Less weight (MOX6 = 7 kg, MOX8 = 14.8 kg)*
- *Up-to-date software bundle*
- *Integration of the MOX as a VSTi plug-in*

An exchange of Voices and Performances between MOX and the MOTIF XS is possible using the software „Total Librarian“ by John Melas.

http://www.jmelas.gr/motif/products.php

S SERIES

In the strict sense the S series does not belong to the MOTIF series. But because the similarities are greater than the differences, however, the models of the S series are included here.

As with the rack-models each of the S series models relates to a particular generation of the MOTIF series:

MOTIF 6 / 7 / 8 „Classic“ = S90

MOTIF ES = S90 ES

MOTIF XS = S90 XS

The S models feature the entire tone generation of the corresponding MOTIF model and additional high-quality Piano Waveforms and Piano Voices.

They are equipped with Balanced Hammer keyboards and are thus mainly focused on the piano playing.

It is possible to exchange Voices and Performances with the relevant MOTIF models, unless the additional Piano Waveforms and Piano Voices or samples are used.

CONCLUSION

Our look at the history of the MOTIF series is over for now.

In the course of this article series we are certainly going to discuss some of the details mentioned here.

In the next episode we will explain some basic concepts of the MOTIF series such as samples, Wave-ROM, Voices, Elements, Performances, Parts, Songs, Patterns, Multis, and Mixings, etc.

PART 3: MOTIF BASICS

In this episode we will discuss some basic terms which play an important role in the MOTIF series. Anyone who would like to seriously work with his instrument should be aware of them.

SAMPLES AND WAVE-ROM

The MOTIF series synthesizers (including Rack, MO, MOX, S series) are - apart from the plug-in boards for MOTIF and MOTIF ES - completely based on samples.

In the field of music sampling is understood as a digital audio or music recording that is used in a new context. Every kind of acoustic and electronic sounds come into question for being sampled, for example, noises, atmospheres, sections of recorded music („loops"), real existing musical instruments, synthesizers, human voices, etc.

In the first part of this series it has already been stated that conventional synthesizers were not sample-based, but working with analog oscillators. The result is a kind of sound that even today is still very popular - analog synthesizer sounds.

A sample-based tone generation is extremely versatile compared to other sound synthesis and has therefore prevailed itself in the range of current synthesizers and workstations.

It is basically possible with sampling to imitate any instrument. This is perfectionized by the so-called „multi-sampling". In this method an instrument or another playable tonal sound source is recorded in different pitches, in order to avoid the transposing of samples, which would result in an unnatural sound. The more different pitches are recorded, the more realistic the original sound can be reproduced. An extreme case would be a „chromatic sampling", ie the sampling of every pitch the instrument can produce. For a sound that is played over five octaves, this would result in 61 samples, which are then arranged on the keyboard („mapping"). But because the sample memory in synthesizers and workstations is limited, a sample usually covers a number of keyboard keys. This is called a Keybank, and a group of Keybanks make up a Waveform (= multi-sample).

A simple mapping of Waveform consisting of several Keybanks (= individual samples) could look like this:

Keybank 1 = C1
Keyboard zone C1 – D#1
Keybank 2 = F#1
Keyboard zone E1 – A1
Keybank 3 = C2
Keyboard zone A#1 – D#2
Keybank 4 = F#2
Keyboard zone E2 – A2
Keybank 5 = C3
Keyboard zone A#2 – D#3
Keybank 6 = F#3
Keyboard zone E3 – A3
Keybank 7 = C4
Keyboard zone A#3 – D#4
Keybank 8 = F#4
Keyboard zone E4 – A4
Keybank 7 = C5
Keyboard zone A#4 – D#5
Keybank 8 = F#5
Keyboard zone E5 – A5
Keybank 9 = C6
Keyboard zone A#5 – C6

This mapping uses two samples per octave. A Keybank thus comprises six semitones. Each sample is transposed up to two semitones down and three semitones upwards. Depending on the sound material this may already lead to clearly audible changes in sound. Because at the transitions of the Keybank's keyboard zones a sample that's been transposed three semitones up meets a sample that's transposed two semitones down.

In the past this had often to be taken into account for the simple reason of memory size.

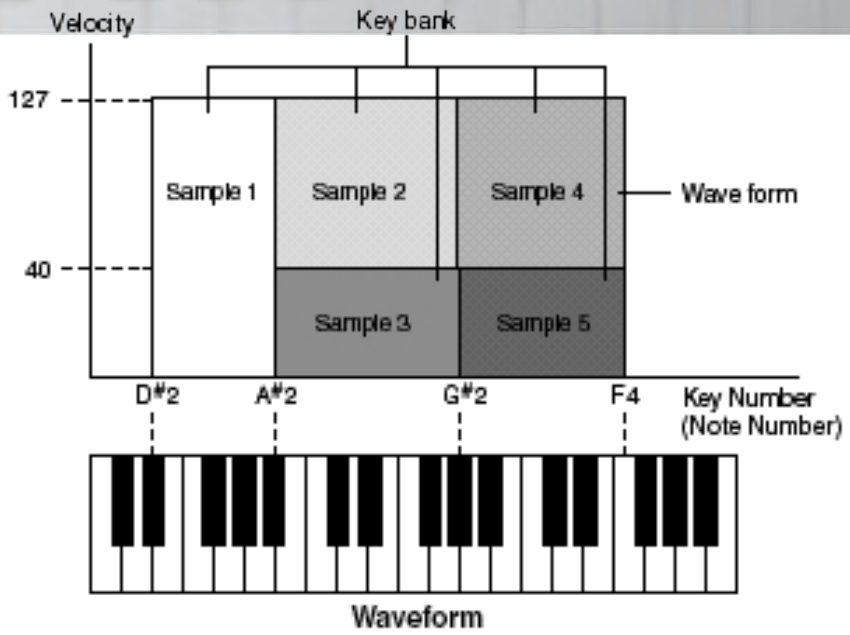
In more recent samplings, however, the trend is towards using much more Keybanks for a Waveform.

If samples for one octave are taken in four different pitches (eg C, D#, F#, A), a Keybank only comprises three semitones.

A mapping for this scheme would mean that each sample has to be transposed by only one semitone up and one down. The transpose effect is barely audible, or at least very inconspicuous.

Keybank 1 = C1
Keyboard zone C1 – C#1
Keybank 2 = D#1
Keyboard zone D1 – E1
Keybank 3 = F#1
Keyboard zone F1 – G1
Keybank 4 = A1
Keyboard zone G#1 – A#1
Keybank 5 = C2
Keyboard zone B1 – C#2

A Waveform mapping can also include velocity ranges in addition to the keyboard zones. Here samples of a certain pitch are available in different velocities and are assigned to corresponding velocity-zones.



In Yamaha synthesizers this sample-based tone-generation is referred to as AWM synthesis. AWM stands for „Advanced Wave Memory". Sampled waveforms are used as the basis for programming realistic imitations of instrument and synthesizer sounds. Parameters as envelopes, filters, modulators and effects are available for further shaping of the sound.

The sampled Waveforms are stored as a Preset Waves in the MOTIF's Wave-ROM. ROM is an acronym for „Read Only Memory". The Preset Waves in the Wave-ROM can not be overwritten or deleted.

That Wave-ROM is the heart of every MOTIF synthesizer.

And the Wave-ROM is always the first step in the development process of a new model.

In general, a large part of the Wave-ROM from the previous model is taken and added with an equally large new part. In the last episode of this workshop we already have shown that the size of the Wave-ROM has dramatically been expanded with each model.

Perhaps you're wondering where to find this heart of the MOTIF? The Preset Waves of the Wave-ROM appear as „Oscillators" in the Voice mode.

You can learn more about that in the next section.

VOICES AND ELEMENTS

A sound stored in MOTIF is called a Voice.

There are two types of Voices:

Normal Voices are mainly musically playable sounds. They can be played across the entire keyboard in the usual tone scales. Normal Voices consist of one or more „Elements". With Elements several sounds can be layered in a Voice.

An *Element* is the smallest unit that makes up a normal Voice. An Element is created by different Voice parameters, that are applied to the raw sample material.

Drum Voices are mainly drum sounds. A Drum Voice consists of percussive and drum sounds, each assigned to specific individual keys on the keyboard, or of groups of such assigned sounds. A Drum Voice is also referred to as a drum kit.

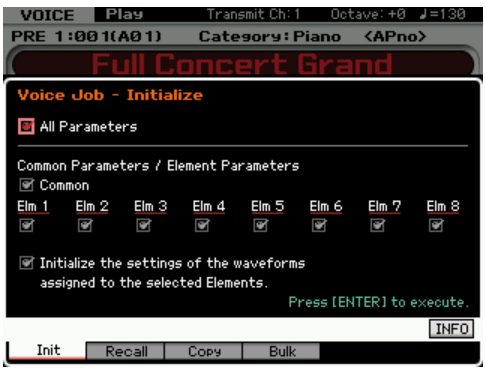
The Voice mode, Elements and the Voice editing process will be discussed in later episodes of this workshop.

Here we want to show you how to access the Preset Waves in the Wave-ROM from within the Voice mode. This is done in the Voice Edit mode, in which Voices can be created or edited.

In order to check the pure Preset Waves - without having them influenced by sound parameters -, it is advisable to initialize a Voice first.

- *To do this on the MOTIF select the Voice mode and press the button JOB*
- *Confirm with ENTER and YES to run the initialization*
- *Then press EXIT to leave the JOB display*

Now, press EDIT to enter the Voice Edit mode.

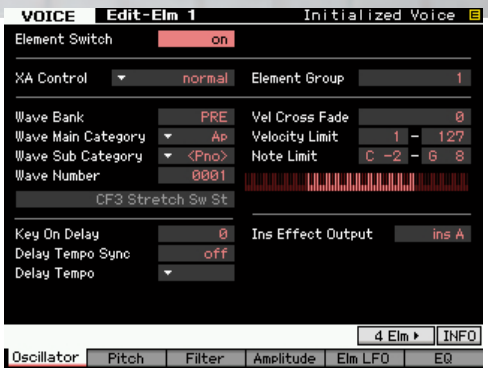

VOICE Play Transmit Ch:1 Octave:+0 ♩=130
PRE 1:001(A01) Category:Piano <APno>
Full Concert Grand
Voice Job - Initialize
All Parameters
Common Parameters / Element Parameters
Common
Elm 1 Elm 2 Elm 3 Elm 4 Elm 5 Elm 6 Elm 7 Elm 8
Initialize the settings of the waveforms assigned to the selected Elements.
Press [ENTER] to execute.
INFO
Init Recall Copy Bulk

Now that COMMON EDIT is active, press the number button 1 to select Element 1 for processing.

In an „Initialized Voice" only the first Element is active, thus set to „ON". The other Elements are switched „OFF". Leave it at that.

Now press the F1 button to call up the *Oscillator* display, in case it is not displayed already.

In classic analog synthesizers, oscillators were electronic components, which generated basic waveforms like sine, triangle, sawtooth, square, and pulse. In synthesizers that are based on a „Wave-ROM", such as the MOTIF, the term Oscillator refers to the output signal of its associated Waveform, its sound is then processed with filters and envelopes.



In an Initialized Voice of the MOTIF XF the Waveform number 0001 (CF3 Stretch Sw St) ist set as default. This acoustic piano is the first Preset Wave of the Wave-ROM. In other synthesizers of the MOTIF series there is also a piano Waveform set, but with a different name.

The Waveform numbers 0001-3977 of the selected Wave Bank „Pre" represent the Wave-ROM of the MOTIF XF. For instrument or synth Waves these are multi-samples, ie individual samples, which are mapped across the keyboard to make a balanced sound. With sound effects and drum sounds usually only one sample is used for a Wave.

Now to get an overview you should select a sound category of your interest and then step through the Wave numbers within the selected category.

But there are some more banks available in addition to the Preset Waves. The bank USR stores User Waveforms. And if Flash-ROM boards are installed, the banks FL1 and FL2 are available.

We will come back to the usage of your own samples or optional soundlibraries in a later episode of this workshop.

PERFORMANCES AND PARTS

These terms are generally used in a very versatile way. But limited to the matters covered in this workshop series - Yamaha tone generators - a Performance is a program that contains up to four Parts. Each Part can include one Voice and features additional parameters that are not available in a Voice. Performances are used for different purposes, that require more than one Voice, but not more than four. Use split points to play different Voices side by side on the keyboard, or layer Voices on top of each other, or use them to be triggered by an arpeggio - or combine all of these possibilities.

A Performance is primarily intended for the use in the respective instrument. For example it is not possible to assign separate MIDI channels to the individual Voices and control them from another device or a DAW. For this reason, the Rack versions of the MOTIF do not feature Performances. Every other MOTIF features a variety of Performances. These cover a very wide range - both in terms of musical style, as well as practical application on stage. (Sound combinations, special live applications, etc.) Performance storage locations are always in the rewritable user area, so you are able to overwrite all preset Performances with your own versions.

Whether you like to start from the scratch with an initialized Performance, take a preset Performance as a template, or simply adjust a preset Performance to meet your requirements, depends on your working style. However, the procedure for programming Performances are somewhat different depending on the MOTIF model. Since the S90XS/S70XS - now also in the MOX - a Performance-Creator function allows a much easier programming of a new Performance in comparison to the MOTIF series.

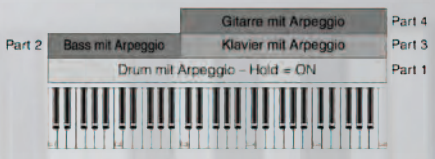
In a Voice there already are individual Elements, as described above. The Performance area is a level above the Parts that are assigned with one Voice each. Simplified this area could be compared with a 4-channel mixer. However, the Performance mode offers much more possibilities than solely adjusting the volume of the Parts and EQing them. The control surface of the instrument with all its sliders, buttons and knobs offer a variety of parameters to directly control finest details of the sound. Examples include filters, envelopes, tempo or groove-relevant parameters such as quantization and so on. So the term „Performance" in general does mean some sort of stage performance. A Performance in the instrument offers extensive intervention in the combination of Voices during the actual performance.

Here are two practical examples. As learned in the section on Voices you are able to set up split and layer sounds with the Elements of a Voice. But to control this combination of Elements, the Voice Edit mode would be necessary in most cases.

Suppose you have a Performance to prepare, with a piano as main instrument. And at certain points of the song you want to have a horn section layered behind the piano.

But the horn section should not respond to the sustain pedal. And it should be processed by a delay as an effect, which in turn should not be applied to the piano. You can easily create such a combination in a Performance and are able to adjust the effect intensity, the volume or the filter for the brass section while playing.

Many preset Performances included arpeggio patterns.



The MOTIF series synthesizers contain thousands of arpeggios, which are categorized according to different instrument types. There are (abbreviated) ARPs for synth sounds, basses, guitars, drums - to name just a few examples. These phrases can be integrated into a Performance and controlled by the keyboard as required. A chord recognition, for example, perfectly transforms a played keyboard chord into a typical guitar phrase. By using so-called Mega Voices this results in a very realistic sound that could not be achieved with „normal" keyboard playing. All four Parts of a Performance can have arpeggios assigned to. Each Performance can have up to five variations of the ARPs, which can be set to fit each other. By this it's possible to create some structure for a Performance from intro to outro. A Hold function for the arpeggios ensures that the phrase doesn't stop after being started by playing on the keyboard. This provides the opportunity to have at least one hand free for parameter changes and such.

Now take a few minutes to work through the Performances of your instrument. Try to determine, how the factory Performances are programmed and what type of musical performance they are suited for.

A good knowledge of the memory contents of your instrument is always very helpful, so you are able to create new variants from appropriate templates, if necessary.

The Performance mode will be discussed in detail in a later episode of this series, so let's proceed with the presentation of other terms.

SONGS AND PATTERNS

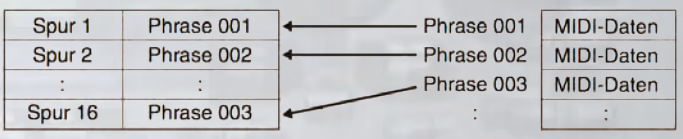
A very large part of the terms we use today as a matter of course in the context of music has its origin in the English language. In many cases, non-native English speakers probably have almost lost consciousness for that.

A Song for instance is first and foremost a tune. However, in music production with synthesizers, workstations, DAW's etc. the term Song is rather used as delimintaion to other notions - for instance to the Pattern.

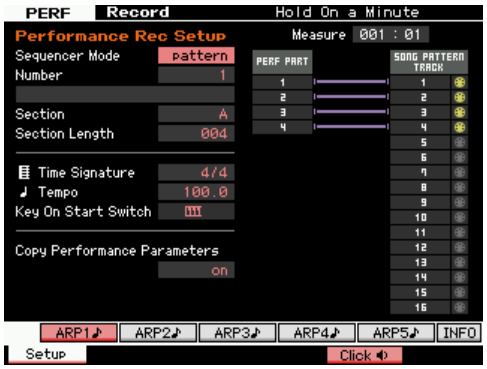
In a musical environment a Pattern could be described as a section that is repeated regularly - thus the music follows a pattern. In earlier years of music production, when the first drum machines were used, a pattern-oriented work was most common. For certain parts of a production, such as Intro, Verse, Bridge, Break, Ending, etc. one-bar phrases (Patterns) were created and then strung together in a meaningful way (this example is limited to the drums), ideally resulting in a song, which closes the circle. Let's take a look at a practical example.

The instruments of the MOTIF series include a so-called Sequencer section, which can be used Song- and Pattern-oriented. Today Patterns can take considerably more musical content than in the aforementioned drum machines.

Below the Pattern there's a smaller unit - the Phrase. A Pattern can consist of up to 16 Tracks, each containing a Phrase. The length can be between 1 and 256 bars.



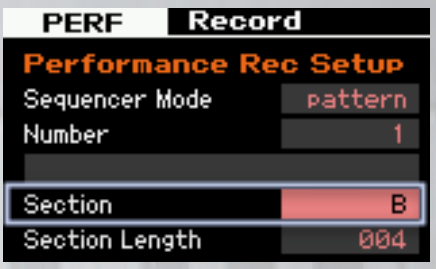
How is a Phrase used in a Pattern? A very elegant and fast method, that is also a lot of fun, is to record a Pattern from playing an ARP-based Performance. You only have to set some very few parameters, such as tempo, time signature and the length in bars and you are ready to produced a Pattern in minutes. Depending on your selection, even a Pattern with several Phrases. So select an ARP-based, four Parts Performance on your MOTIF that suits your taste. If necessary, adjust the tempo and play a few minutes to learn as you go. Now suppose you want to produce a four-bar Pattern, which contains a different chord per bar. Press the RECORD button to call up the following screen where you can make any necessary adjustments.



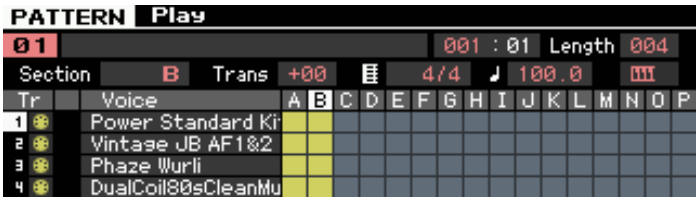
Since you have previously set the tempo and the default value for the length of the recording is set to four bars, you only have to press the START button and start playing your first chord after the count-in. The recording automatically stops after the fourth bar. Enter the Pattern mode, press the START button and enjoy the acoustic fruits of your work.

You just have created a four-bar Pattern with four Phrases in the shortest time and made the experience that this Pattern - as described above - is repeated in a loop until you press the STOP button.

If you now want to follow the transition to a Song, please go back to your original Performance. All you need to do, is to press the RECORD button again and change the Section to „B".



Start to play another chord progression after hitting the START button and listening to the count-in. Choose chords that are suitable as an alternative to Section „A". In the Pattern Play mode you will then see the Sections „A" and „B", each having four Phrases assigned to. Use the Bank Select keys to switch between Section „A" and „B" during playback.



To make a Song from that exemplary Pattern, you simply create a sequence of the Sections. To do this, enter the Pattern Play mode and press „F5" to call up the „Chain" display.

Press RECORD and then PLAY and start to switch between the Sections „A" and „B" after the count-in. You don't have to wait for the four bars of each Section, you can change bar-wise, too. The Pattern Chain you just have created can be played back from the Pattern Play mode.

Although the sequence of the Sections already has a certain Song character, a further step towards a „real" Song is necessary.

After pressing the EDIT key and SF3 (labelled with „Song>" in the display), select a free song storage location and press ENTER & YES to start the conversion of the Pattern Chain into a Song. The result can now be played from the Song mode, which at this stage is no different to the Pattern Chain. But by activating the next available track (track 5) you are ready to record for instance a melody on top of your backing tracks with your chord progression.

After this last step the term Song is fully justified.

Please look back a few lines in your thoughts. Provided a little routine with the procedure described above: Can you think of a faster way to create a professional-sounding Song? We don't think so and would proudly proof that on any suitable occasion. We will later come back to recordings that allow extensive post processing.

Back to theory: A Song can include up to 16 Tracks. Whether these Tracks are recorded like shown in the above exemplary manner, or if you record track by track, or import a finished song as standard MIDI file, is completely up to you. The maximum capacity of the MOTIF's Sequencer (Patterns and Songs in total) is about 130,000 events. However, these events include such as aftertouch, pitch bend, and modulation wheel, thus reducing the capacity when intensively used.

MULTIS, MIXINGS

With the Production of a Song in one way or the other, the focus was on the musical content. Now, with the terms Mixing and Multi we would like to complete this part of the Yamaha Synth Guide.

Multi is initially an acronym that in terms of modern music equipment describes the potential of a tone generator to be able to play multiple sounds simultaneously. In Yamaha synthesizers a Multi is a program in the instrument which organizes up to 16 Voices that can be simultaneously controlled from different MIDI channels - in contrast to the previously described Performance. With the S90XS/S70XS this label lived again in the context of current Yamaha workstations. In the MOTIF series this program was labeled as a *Mixing*. It's in fact exactly the same thing - at least in Yamaha terminology -, so we basically just talk about a term and because of the greater spread we will continue to talk about Mixings.

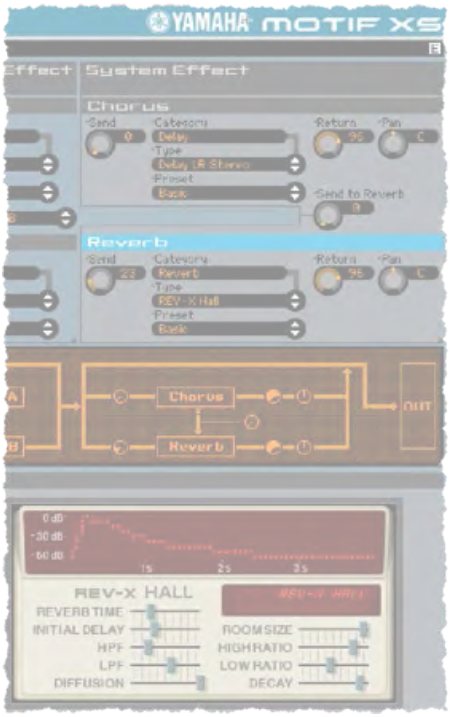
The term Mixing has its origin in „mxing" sounds, obviously. Due to the fact that multitimbrality can be considered as a matter of course, Mixing is a better description of this MOTIF's program, because the 16 Voices are actually conducted through a virtual mixing console within the instrument. As with a hardware mixing console volume ratios, equalizers, panorama positions, effect units and a lot more can be set and stored, making your Song a finished production directly out of the instrument. The MOTIF series features 64 Song and Pattern Mixings. The current S series features 128 Multis, for there is no true integrated Sequencer and Pattern-oriented work is not possible.

Regardless of the built-in Sequencer Mixings and Multis are also used to work with an external DAW (eg Cubase, Logic). In this case the instrument is used as a pure tone generator. Since a version of Cubase AI is included with all current Yamaha synthesizers and corresponding editor softwares are available as free downloads from Yamaha, it is possible to seamlessly integrate the synthesizers into the DAW environment and work with the tone generation without having to actually make any settings on the instrument. Most current devices also offer to use their hardware controls to control someof the DAW's functions like the transport control (Start, Stop, Record, etc.).

There is a further application scenario for the Mixings apart from working with Patterns and Songs: The live performance on stage. The polyphony and multitimbral capacities of modern workstations now no longer require the use of entire fleets of instruments, like just a few years ago. You have already learned that Performances offer you the possibility to customize up to four Voices to meet your needs on stage. We have also demonstrated the limits of Performance and that they are significantly shifted with the Mixings. You can use them to have up to 16 Voices for your live performances at hand. Mixings also allow to create split and layer combinations. Especially in combination with external keyboards, expanders or MIDI equipment in general it is very advantageous to be able to assign each Voice to its own MIDI channel.

For serious users of the instruments covered by this guide, the knowledge of the structure of the Sample, the smallest unit, right up to the finished production within a Mixing is very helpful. Few musicians will really exploit any part of these very versatile workstations. Perhaps that's why this little guidance through the maze of terms and parameters enables you to select which of the coming episodes are of interest for you. We hope this part could help you and see you here again next time.

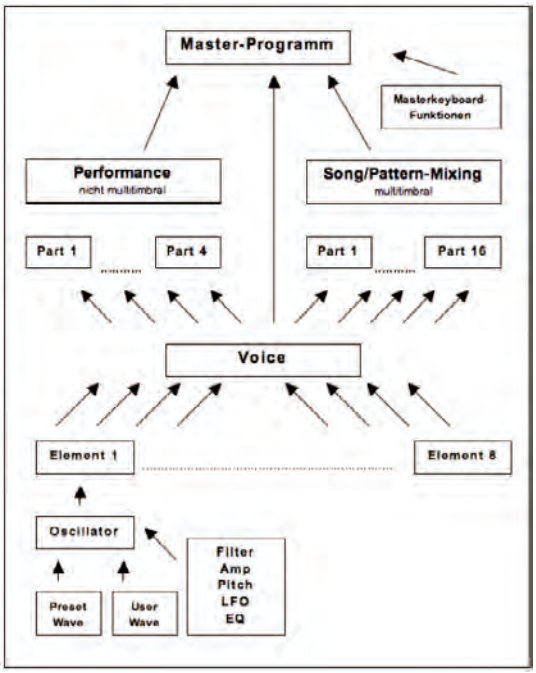
PART 4: MOTIF SOUND ARCHITECTURE AND CONTROLS



This episode is about the sound architecture of the MOTIF and basic operating steps. We are refering to the basic concepts of the MOTIF series described in the last episode.

THE STRUCTURE OF THE MOTIF

You will find it much easier to operate the MOTIF when you have an understanding of its basic structure.



Please take a look at the diagram in which the different sound layers of the MOTIF are shown.

The basic sound of the MOTIF is called a **Voice**.

A Voice consists of up to eight Elements. Each Element has a Waveform (a Preset or User Wave) assigned, which is then modulated like an „oscillator" by the sound modules Filter, Amp, Pitch, LFO, EQ, etc. to a partial sound. The overall structure of a Voice consists of the Elements, the Effects and the Arpeggiator.

The next level is either a **Performance**, a **Song** or a **Pattern**, which each have assigned Voices to a different number of Parts.

Performances consist of maximum four Parts that can be layered on top of each other or split over distinct keyboard ranges. These Parts are controlled via a common MIDI channel („Basic RcvCh"). Performances are important for live use or for very complex sound-combinations.

Songs and **Patterns** can use up to 16 normal Parts, which can be set in the **Mixing Mode**. Each Part can be assigned to an individual MIDI channel, but several parts can also be assigned to the same MIDI channel.

The top level is the **Master Mode**, which is used to sum up the programs of the other Modes. So the Master programs can be assigned to either Voices, Performances, Songs, or Patterns. In addition the master-keyboard functions can be used to control external MIDI devices from different zones.

BANK- / GROUP- / NUMBER BUTTONS

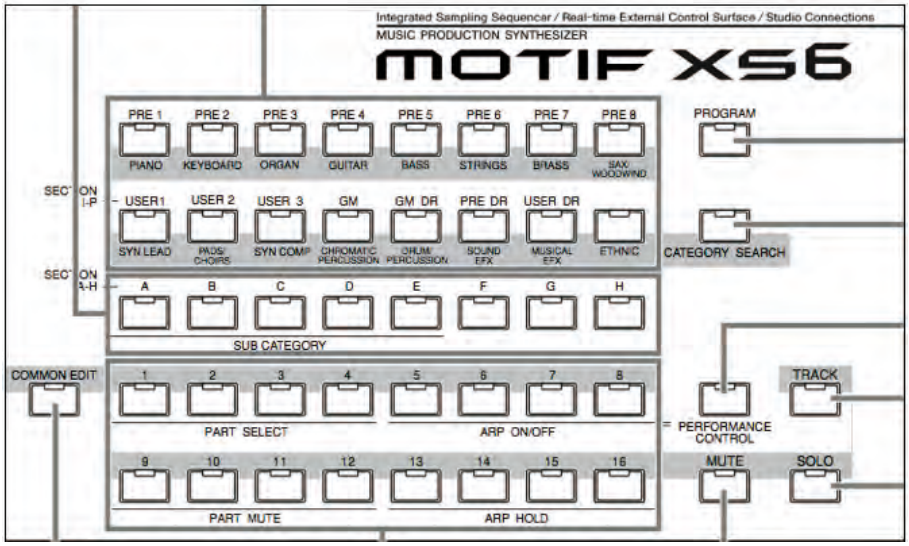
The selection of Voices and Performances are done with the Bank, Group, and Number buttons.

The **Bank buttons** are used to select the Voice Banks (PRE1 to USER DR) and the Performance Banks (USER1 to USER3 or USER4). In addition, they select the Main Categories when the CATEGORY SEARCH function is activated (see sub-label of the buttons).

The **Group buttons** are used to select the Voice or Performance Groups A - H. These consist of 16 programs each. They can also choose the Sub Categories when the CATEGORY SEARCH function is activated..

The function of the **Number buttons** 1 - 16 depends on the status of the [TRACK SELECT], [MUTE], [SOLO] and [PERFORMANCE CONTROL] buttons, as shown in the table below.

In addition to the modes listed in the table the [PROGRAM] button is of importance, for it is used to return to the selection of Voices or Performances in the respective PLAY Mode.



Functions of the Number [1] – [16] buttons

Mode	[PERFORMANCE CONTROL] button	[TRACK] button	[MUTE] button	[SOLO] button
Voice Play	—	Keyboard transmit channel setting	—	—
Normal Voice Edit	—	Changes the Edit mode from Common Edit to Element Edit and Element selection (1 – 8)	Element Mute setting (9 – 16)	Solo Element selection (9 – 16)
Drum Voice Edit	—	Changes the Edit mode from Common Edit to Drum Key Edit	—	—
Performance Play	Performance Control (33)	Keyboard transmit channel setting	Part Mute setting (1 – 4)	Solo Part selection (1 – 4)
Performance Edit	Performance Control (33)	Performance Part selection (1 – 4)	Part Mute setting (1 – 4)	Solo Part selection (1 – 4)
Master Play	—	Keyboard transmit channel setting (when memorizing the Voice mode or Performance mode to the current Master) or Song/Pattern track selection (when memorizing the Song mode or Pattern mode to the current Master)	—	—
Master Edit	—	Changes the Edit mode from Common Edit to Zone Edit and Zone selection (1 – 8)	—	—
Song Play/ Pattern Play	—	Song/Pattern track selection	Song/Pattern track Mute setting	Solo track selection
Song Mixing/ Pattern Mixing	—	Song/Pattern Part selection	Song/Pattern Part Mute setting	Solo Part selection
Mixing Voice Edit	Element selection (1 – 8)	Element selection (1 – 8)	Element Mute setting (9 – 16)	Solo Element selection (9 – 16)

The following sections show how to use the Number buttons in each mode and what to have to bear in mind.

But before we start, here's a short notice for those users who have previously worked with an older MOTIF synthesizer (eg MOTIF ES): On the MOTIF XS / XF the buttons PROGRAM and PERFORMANCE CONTROL were added. And instead of the combined MUTE/SOLO button separate MUTE and SOLO buttons were added. These new buttons result in an advanced operational concept.

VOICE PLAY MODE

The Voice Play mode is used to select and play the Voices. In this mode, the PROGRAM button is activated by default. The selection of the Voice can then be done using the Bank / Group / Number buttons.

If necessary, activate the TRACK button to set the MIDI Transmit Channel using the Number keys 1 - 16. Hit the PROGRAM button to return to the Voice selection.

PERFORMANCE CONTROL, MUTE and SOLO have no function here.

VOICE EDIT MODE

The Voice Edit mode is used for the editing and programming of Voices.

If the TRACK button is activated, the COMMON EDIT button selects the Common part and the Number buttons 1 to 8 the corresponding Elements 1 - 8 to be edited.

If the MUTE button is activated, the Number buttons mute the Elements 1 - 8.

And if the SOLO button is switched on, the Elements can be soloed.

PROGRAM and PERFORMANCE CONTROL have no function here.

PERFORMANCE PLAY MODE

In this mode, the PROGRAM button is activated by default, so the Bank / Group / Number buttons are used to select the Performances.

PERFORMANCE CONTROL allows a comprehensive and very effective control. With this button activated, the Number buttons [1] - [16] are assigned to the following functions, which are also indicated by the label below each Number key:

Number buttons	Function
[1] – [4]	Selecting Parts 1 – 4.
[5] – [8]	Setting the Arpeggio Switch to on/off for Parts 1 – 4.
[9] – [12]	Setting the mute status for Parts 1 – 4.
[13] – [16]	Setting the Arpeggio Hold for Parts 1 – 4.

If the TRACK button is active, the Number keys 1 - 16 are used to set the MIDI Transmit Channel.

If the MUTE button is activated, the Parts 1 - 4 can be muted using the Number buttons 1 - 4. However, the mute function is also contained in the PERFORMANCE CONTROL function described above, where the Number buttons 9 - 12 can be used to mute the Parts.

If the SOLO button is switched on, you can use the Number buttons to solo a Part.

Hit the PROGRAM button to return to the Performance selection..

PERFORMANCE EDIT MODE

The Performance Edit mode works similarly as the Performance Play mode. There are only two exceptions:

If the PROGRAM button is active, the Bank / Group / Number buttons are used to select the Voice (Bank + Number) for the currently selected Part of the Performance.

If the TRACK buttons is switched on, the Parts 1 - 4 can be selected.

PERFORMANCE CONTROL, MUTE and SOLO have the same function as in the Performance Play mode.

MASTER PLAY MODE

In the Master Play mode the PROGRAM button is active by default.

Since there is only one Master Bank, the Bank selection is fixed to USER1. The Group and Number buttons are used select from the 128 Master-Programs.

If a Voice or Performance is assigned to the Master, switching on the TRACK button lets you set the MIDI transmit channel using the Number buttons 1 - 16. But if a Song or Pattern is assigned to the Master, activating the TRACK button lets you select the Song's or Pattern's Track.

Hit the PROGRAM button to go back to the selection of Master programs.

PERFORMANCE CONTROL, MUTE, and SOLO have no function here.

MASTER EDIT MODE

The Master Edit mode is used for the editing of the Master programs (especially of the Master Zones). In this mode the TRACK button is activated by default. The COMMON EDIT button selects the Common part, the Number buttons 1 - 8 select the Master Zones 1 - 8 to be edited.

PROGRAM, PERFORMANCE CONTROL, MUTE, and SOLO have no function.

SONG AND PATTERN MODE

In the Song and Pattern mode, the TRACK button is activated by default, allowing the selection of the 16 Song/Pattern Tracks using the Number buttons.

The MUTE button allows you to mute the Song/Pattern Tracks.

The SOLO button allows you to solo a Song/Pattern Track.

If the PROGRAM button is switched on, the Group / Number buttons are used to select Songs/Patterns.

PERFORMANCE CONTROL has no function.

SONG MIXING / PATTERN MIXING

In the Song and Pattern Mixing mode, the TRACK button is turned on by default, allowing the selection of the 16 Mixing Parts using the Number buttons.

The MUTE button allows you to mute the Mixing Parts.

The SOLO button allows you to soloe a Mixing Part.

Activate the PROGRAM button to select the Voice assigned to the Parts using the Bank / Group / Number buttons.

PERFORMANCE CONTROL has no function here.

MIXING VOICE EDIT

This mode is available from the Mixing mode by pressing F6 („Vce Edit") and works just like the Voice Edit mode (see above).

SO HERE'S A SUMMARY:

In the Play modes the Number keys are primarily used for the selection of the corresponding programs. The only exception: If the TRACK button is active, they are used to set the MIDI Transmit Channel.

In the Voice Edit mode you switch between TRACK (selection of Common and Elements), MUTE (to mute Elements), and SOLO.

In the Performance Edit mode it is advisable to use the PERFORMANCE CONTROL function.

In the Song and Pattern mode you switch between TRACK (selection of Tracks or Parts), MUTE (muting of Tracks or Parts), and SOLO.

Use PROGRAM to return to the program selection in all modes.

IMPORTANT CONTROLS

To the left of the Bank/Group/Number keys the instruments MOTIF XS/XF, MOX, and S70/90XS feature buttons with the following names: FILE, UTILITY, EDIT, JOB, and STORE.

FILE

With this button, the entire file management is in reach. In connection with USB memory devices, volatile or non-volatile RAM, and the Flash Memory of the MOTIF XF series this menu is used to load or save data from the instrument. Furthermore, storage media are prepared and organized from this menu. In addition, you are able to record and play back audio signals.

The MOTIF-RACK XS has no FILE button and no USB TO DEVICE port to operated storage media. Here, all data backup is done via the USB TO HOST interface using a bulk dump to a connected computer instead.

UTILITY

The UTILITY menu offers several functions which affect the system of the instrument as a whole. Here parameters such as, for example, the total volume of the tone generator or the tuning are available. You can adapt the display design to your personal preferences, set network settings or determine an auto-load-file.

For MOTIF XS, MOTIF-RACK XS, and MOTIF XF the settings for the optional FireWire card can be found.

Another very important area is submenu „Control". Apart from the controller assignments another submenu features the MIDI-related settings, like the interface (MIDI, USB, mLAN), and synchronization settings in conjunction with other devices or software. On the MOTIF XF you can also access the Waveform list of the optional Flash Memory.

EDIT

Depending on the selected Play mode (Voice, Performance, Multi/Mixing/Song, Master) this button calls up the corresponding Edit mode. As soon as a parameter was changed, this button can be used to trigger the „Compare" function, allowing you to quickly compare the resulting changes in comparison to the parameter's original values.

JOB

This button calls up the Job menu - which is very different for each of the different modes of the instruments. It would take several pages to completely describe all of the functions. Many experienced users might have missed the formerly available „INIT" button, that allowed users to initialize a program of the different play modes. This function is now incorporated as a „Job". Other functions are - only in part - copying or deleting things, eg a Pattern, Events, Tracks, etc.

Since there are no jobs on the MOTIF-RACK XS, there is no such button.

STORE

The main function of this button is to save your work to the memory of the instrument, again based on the different modes and available user memory locations. On the MOTIF XS/XF this button has the alternate function „SET LOCATE", which is used in connection with the song-control, just like „SCENE STORE" (MOTIF XS/XF, and MOX).

Since the MOTIF-RACK XS does not feature a sequencer, these alternate function are not required.

The buttons SONG, PATTERN, MIXING, and MULTI call up the respective modes, that have already been discussed in the previous section of this guide.

NAVIGATION AND DATA ENTRY

One „block" on the control panel to the left the cursor buttons to navigate within the display can be found: [◄▼▲►]

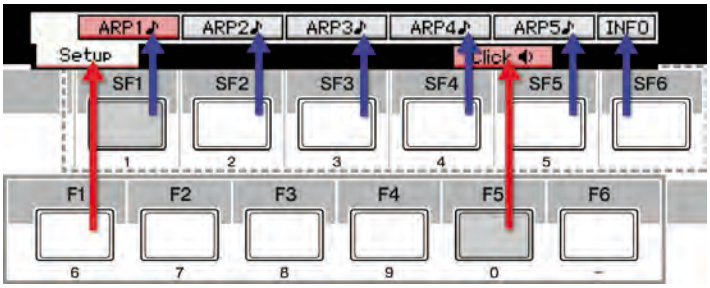
The buttons [INC / YES] and [DEC / NO] have alternate functions. With INC/DEC they can be used to change a value in the smallest possible step - for fast and large value jumps it is recommended to use the DATA wheel.

With YES/NO they are used to answer those familiar questions like „Are you really shure?" The ENTER button confirms data entry or storage operations when a dialog prompts you to.

There are no [INC/YES] and [DEC/NO] buttons on the MOTIF-RACK XS, MOX and S70/90XS on the other hand have an additional [SHIFT] button which has a special function assigned, depending on the current mode.

FUNCTION BUTTONS

Below the display of the MOTIF XS/XF and MOX the Function buttons F1-F6 and SF1-SF6 are located. These are used in combination with the display, hence their function varies accordingly to the current mode.



If NUM appears in the display, the Function buttons - now assigned to the numbers printed below - can be used for the direct input of values.

REMOTE BUTTON

This button - called „REMOTE ON/OFF" or „DAW REMOTE" - is reserved to the keyboard versions of the MOTIF-series and allows to remotely control music production softwares like Cubase, Logic Pro, SONAR, etc. This is especially useful for controlling the software's sequencer functions, for

example to control the transport functions directly from the keyboard. However it is necessary to correctly set up the DAW, in some cases to install additional software.

ARPEGGIO BUTTON(S)

On the MOTIF XS/XF there is a central [ARPEGGIO ON/OFF] button to control the Arpeggiator. The MOX features an [ARPEGGIO EDIT] button to directly enter the screen-supported ARP EDIT mode. The Function buttons below the display of the MOTIF XS/XF and MOX can be used to select the current Arpeggio Phrase. On the S70/90 XS there is a separate keypad above the zone faders.

EFFECT BUTTONS

To the left of the display of the MOTIF XS/XF and MOX there are three buttons to enable/disable the effects. Insert, System and Master effect can be switched here separately, without having to enter an edit mode. This feature is very useful to quickly compare two Voices without effects or for recording situations where external effect units are to be used.

On the S70/90 XS the five buttons [ARP SELECT - EFFECT ON/OFF] to the left of the display can be used for this purpose.

OCTAVE AND TRANSPOSE BUTTONS

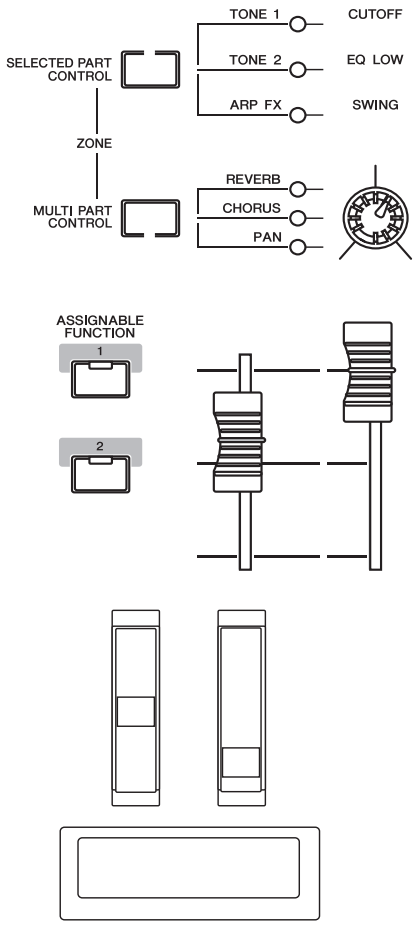
The MOTIF XS/XF features [OCTAVE] buttons, which can be used to shift the octave of the keyboard. The MOX and S70/90 XS have additional [TRANSPOSE] buttons on the control panel to transpose the pitch of the keyboard in semitone steps.

SEQUENCER TRANSPORT

Found again only on the models MOTIF XS/XF and MOX with built-in sequencers - these buttons are largely self-explanatory, simply allowing the control of the sequencer.

They are used in combination with the control panel (Control Section) with its faders and knobs, and will be discussed in the next part of this series. The [ASSIGNABLE FUNCTION] buttons and their the various possibilities are described later, too.

PART 5: MOTIF CONTROL SECTION



As announced this episode is all about the controller block.

This includes the keyboard, pitch bend and modulation wheel, the ribbon controller, and the knobs and sliders.

KEYBOARD

The keyboards of modern synthesizers have achieved a certain independence due to the introduction of the MIDI interface. Strictly speaking, in conjunction with the MIDI controller board the keyboard can be considered as a separate unit.

Each key of the keyboard gives the following information: Note on/off events (which results in the pitch and the length of the note), velocity, and aftertouch.

The velocity is measured in terms of the speed a key is played with. Aftertouch offers a pressure point after the keystroke. While holding down the key variable pressure force generates additional controller data. The MIDI controller board adds the pitch (note) to the said information for each played key.

Normally, this data will be sent to the second major unit of a synthesizer - the tone generator. However, a single parameter setting in the UTILITY section called „Local Control" determines whether the data of the keyboard is sent directly to the tone generator (Local = on) or only via MIDI (Local = off).

Since in electronic instruments no more mechanics are used beyond the key, all this information is present in the form of data. This data can be manipulated accordingly. For example, you can change the octave of the keyboard, or add or substract a value to the notes you play in order to obtain a transposition. Thus, it is possible to play in a key which differs from the key you actually play. Velocity and aftertouch can also be modulated - the how and why they are used will be the topic of one of the following parts of this workshop.

The described separation of keyboard and tone generator offers innumerable options to integrate other sound modules or a computer with appropriate software.

PITCH BEND WHEEL

The pitch bend wheel is usually used for changing the pitch of a note - following its designation. Moving it upwards or to the front - as seen from the player - increases the pitch, the opposite movement results in a reduction of the pitch.

As the detuning is specifically produced in a high resolution, you can use it to imitate special playing styles of several acoustic instruments. For blowing or stringed instruments, for example, the pitch-variation of a note before or after the correct counting is a regularly used style. This way of playing wouldn't be possible to recreate on a keyboard without pitch bends.

The range of the pitch bends can be specified with the according parameter of the Voice. It is also possible to assign a different function to the pitch bend wheel by changing the type of the generated controller data.

The pitch bend wheel is spring loaded, so it automatically returns to the zero position (center position) after releasing it. An error in these mechanics usually results in a detuning of the instrument. So, if there are any problems with the instruments overall pitch it is advisable to take a closer look at the pitch bend wheel.

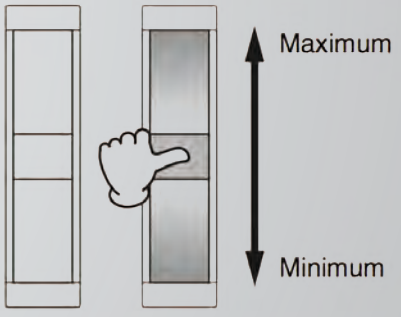
MODULATION WHEEL

The Modulation wheel - or mod wheel in short - has a standard connection to the controller type „Modulation". In many cases this produces a vibrato. As with the pitch bend wheel you can of course change this default setting to another controller number.

Typical assignments are filter sweeps, effect depths, rotary speed for leslie effects, etc.

The Preset Voices give many examples of meaningful assignments, the creativity of the user, however, is set few limits.

In contrast to the pitch bend wheel the modulation wheel has no return spring. Therefore, it makes sense to pull the wheel back to the minimum position to avoid the accidental activation of an effect after switching to a different Voice.



A small example of an alternative usage: Suppose you want to detune the last sound of a synthesizer solo way down below the range that is set for the pitch bend wheel. This is possible by assigning the modulation wheel to the controller „coarse tune" and setting the value range to the desired detuning (up to -64 semitones). Now you have the normal pitch-bending for your performance within the normal range and you are also able to use the desired detuning on that last note.

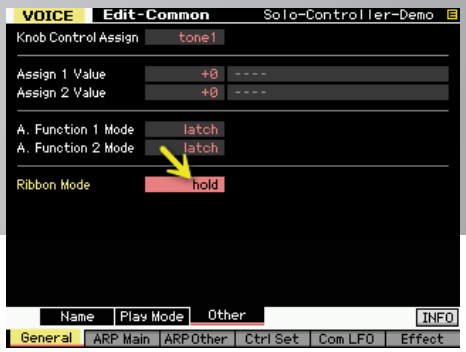
RIBBON CONTROLLER

The ribbon controller is a pressure-sensitive sliding band, which is also assignable to all sorts of controller data. Due to the fact that its mechanism behaves differently from that of the wheels, you can also use the above-mentioned types of modulation here to open up new possibilities.

With the ribbon controller - contrary to the wheels - you can directly reach a value, without having to scroll through the intermediate values. And since you can program for each Voice, whether the value automatically falls back into a central position or not, there are many possible variants. Here, too, diverse suggestions can be taken from the Preset Voices.

Again a small example: Just by his angle offset to the wheels by 90° the pan position of a Voice or of individual Elements is an obvious idea. The parameter „Ribbon Mode", which is stored with each Voice (Voice Mode → Edit Common → General), determines whether the value jumps back to the zero position (reset) after releasing the ribbon or remains in the last position (hold).

So you are able to directly change the pan position while you're playing, either temporarily or for specific parts of a song.



AFTERTOUCH

Aftertouch does not have a separate control element, such as the aforementioned components of the controller section, but adds an additional controller to the traditional function of a keyboard. By using a pressure sensor after playing a key, the played note can be modulated.

Almost all assignable controller numbers can be assigned to the aftertouch, even the features that are normally accessible via other physical controllers. A typical application is Expression, which enables you to create a crescendo that is suitable not only for wind sounds. But vibrato, tremolo, pitch bend, filter sweep effects, or the volume of certain Elements of a Voice can meaningfully complement your performance, too.

And so again, only a few examples were mentioned. It is worthwhile to invest some creativity here.

MANY CONTROLLERS, MANY OPTIONS

Perhaps the described variety may seem confusing at first. For example you might ask yourself: „Why do I need to be able to assign pitch bend to two wheels, one ribbon controller and aftertouch?“

To be able make a good decision concerning the controller assignment you must first have to know the context you want to play the Voice in. Another criterion is whether a well-defined intermediate value of the controller is to be achievable (which is hardly possible using aftertouch for instance) or not. Here are a few tips and a practical example.

It is obvious that for operating all said controllers - except aftertouch - a free hand is required. For more complex organ-works, it is not unusual that in addition to the player another person is present for choosing the registers and/or turning the music sheets. Although there are plenty of possible interventions for many hands on modern synthesizers, current performances rather not make use of additional personnel.

So let's assume you want to play a synthesizer solo and add a pad sound with your left hand over the entire part of the solo. For the solo sound you need pitch bend (+ 2 semitones) and vibrato, you want to influence the filter and at the end of the solo the last note should disappear in a giant „reverb cloud“. During the solo there is no time to operate a wheel, so pitch bend must be realized using aftertouch.

Pitch bend can not be assigned directly to the aftertouch, but the same result can be achieved by using the tuning parameters („coarse tune“ and „fine tune“).

The vibrato can be synchronised to the tempo of the song and the speed of the solo, it can also be faded in for longer notes within a defined period of time. This is achieved using a LFO - totally without any controller.

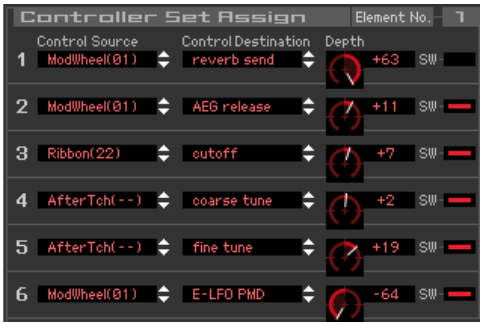
Cutoff (Filter) is assigned to the ribbon controller (set ribbon mode to „hold“) and the reverb cloud to the modulation wheel.

By doing so you are able to play your solo with one hand. For changing the filter value, it is sufficient to briefly use your left hand during a chord change. Alternatively, you can use the sustain pedal exclusively for the pad sound - that way your left hand is available to operate controllers during longer sustained chords.

As a cherry on the cake here's another tip from the bag of tricks: Each controller can be assigned more than once in order to influence different parameters simultaneously. That is very suitable for sending that last note of the solo into the planned reverb cloud. With the parallel control of AEG release value you can release the last played key after having pulled the modulation wheel up - then the note is slowly decaying in an enlarged reverb cloud.

With a third assignment to the modulation wheel even the self-settling vibrato can either be eliminated or at least reduced to a desired level.

Consider the possibility to set these controller assignments only to certain Elements. The following screenshots show the controller settings for the example, so you might try them for yourself on a solo sound. As a starting point we have used the Preset Voice „Soft RnB“ from the „Ld“ (Lead) category.


Controller Set Assign
Element No. 1
Control Source
Control Destination
Depth
1 ModWheel(01) reverb send +63 SW
2 ModWheel(01) AEG release +11 SW
3 Ribbon(22) cutoff +7 SW
4 AfterTch(--) coarse tune +2 SW
5 AfterTch(--) fine tune +19 SW
6 ModWheel(01) E-LFO PMD -64 SW

KNOBS AND SLIDERS

On the MOTIF XF and MOTIF XS eight knobs and eight sliders are available for the real-time controlling of parameters.

While the sliders are responsible to control the volume of each Part or Element, the knobs are used for a variety of different parameters.

Using the buttons SELECTED PART CONTROL and MULTI PART CONTROL you can select the current group of functions. TONE 1, TONE 2, ARP FX for the Selected Part Control and REVERB, CHORUS, PAN for the Multi Part Control.

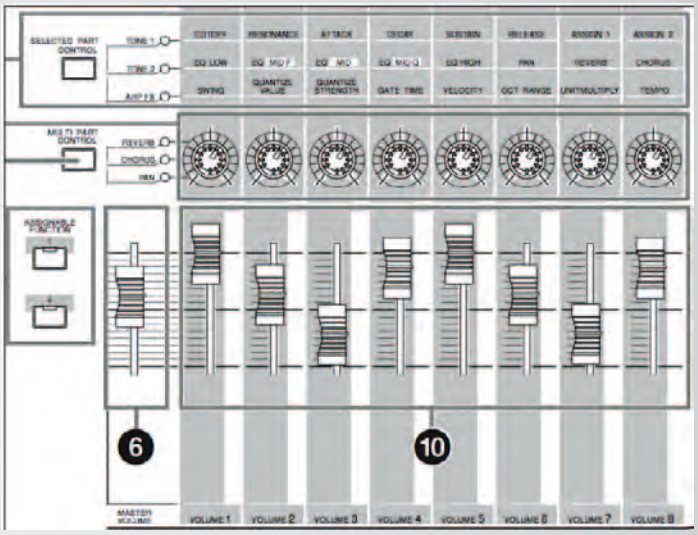
The MULTI PART CONTROL button can only be used in Performance, Song, or Pattern mode. The presence of two buttons considerably facilitates switching, because if only one button was provided, you would have to press it five times to get from the first to the last position.

The two buttons work together, so that of all the function groups only one LED is lit, namely the active function.

For example, if in a Performance the LED for function TONE 1 is lit, pressing the SELECTED PART CONTROL toggles between the functions TONE 1, TONE 2, and ARP FX. If the button is held a little longer automatically the first function TONE 1 is activated.

As soon as the button MULTI PART CONTROL is pressed, the currently active LED in the upper group (SELECTED PART CONTROL) is switched off. Instead, the first function of the lower group (REVERB) is activated. Now you use SELECTED PART CONTROL to toggle between the functions REVERB, CHORUS, and PAN. A longer push activates REVERB.

In the PLAY mode the functions assigned to the knobs and the current knob settings automatically appear in the display. In EDIT mode it is sufficient to select a function with SELECTED PART CONTROL or MULTI PART CONTROL to display the knob's settings and values.



The display shows the physical positions of the knobs. If these do not match the programmed settings, a small red triangle next to the displayed knob indicates the current parameter's value of the selected sound.

Turning the knobs has no effect until this indicated current value is reached. As soon as the position of the red triangle is reached, it disappears and the movement of the knob affects the sound.

Tip: If you find that the movements of the knobs remain ineffective, take a look at the display. Presumably, you will discover the red mark, which has to reached first.

This procedure is known as „picking up the value" in synthesizer jargon. It is usually not necessary if the knobs are at their center position when you call up a sound program.

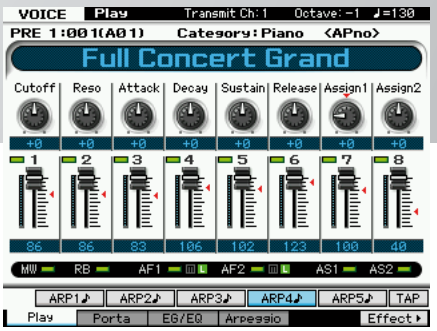
At least with the factory sounds, the knobs were not used to influence the sound, which is quite reasonable. Because this ensures that parameter values always match the locked center position of the knobs.

For the sliders a divergence of the physical position of the slider and the actual parameter value is indicated by the red triangle marks, too. The following two illustrations show the principle of operation.

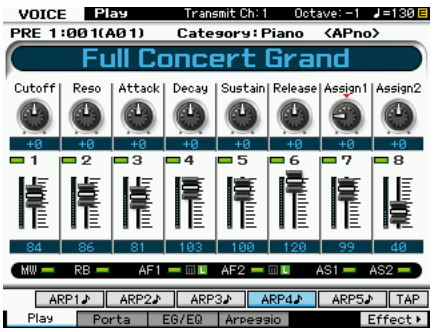
First, the physical positions of the sliders are all set to maximum. The set parameter values, ie the levels of the Voice's Elements, are displayed with the red triangle.

In the second picture the sliders are adjusted to the actual parameter values - the values were „picked up". The red triangle marks are no longer visible.

Step 1: The differences between the parameter's value (Element Level) and the physical position of the slider (maximum) is indicated by red triangles.



Step 2: The physical positions of the sliders match the actual parameter values. There are no red triangles.



Unlike the Voice or Performance mode the red triangles do not appear in the Mixing display of the Song or Pattern mode. Here, however, the displayed value of each Part can be used as a guide.

In Performance mode, the knobs can control the tone for each Part separately. For the functions of the MULTI PART CONTROL group this is possible at any time. For the SELECTED PART CONTROL functions it is only possible, when PERFORMANCE CONTROL is set to ON. The knob movements are effective for the Part that is selected via one of the number buttons 1 - 4. This can be monitored very nicely in the display, where different values appear with the selection of one of the four Parts. A global control of all four Parts is still possible if COMMON EDIT is pressed.

In Song and Pattern mode the knobs control the currently selected Track. An overall control of all the Tracks wouldn't make much sense here.

But there is one exception, where multiple Tracks can be simultaneously controlled with knobs and sliders. This is the case when the respective Parts are set to the same Receive Channel.

DEVIATIONS IN THE MODELS MOTIF-RACK XS, MOX, AND S70/90 XS

The MOTIF-RACK XS as a pure tone generator is an exception in the family of MOTIFs. All of the knobs and sliders of the MOTIFs keyboard versions are designed for real-time control of parameters in conjunction with a fast access. So fast and direct control is ensured during live performances, among others. Besides the most essential buttons for operation, editing and parameter changing the rack version offers five knobs for direct, real-time access. Sliders were not possible, however, for lack of space.

The operation principle of the knobs from the MOTIF XF / XS, as described above, was taken over in the MOX, and the S70/90 XS, only in a partially reduced form.

The MOX features eight knobs, but arranged in two rows. The S70/90 XS has four knobs located on the control panel. These are also assignable to five different sets of parameters. The MOX has no additional sliders. The S70/90 XS features four sliders, whose assignment can be selected with a selection button - similar to the knobs.

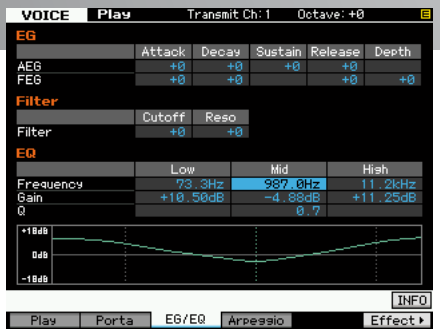
CONTROL PARAMETERS: AMP ENVELOPE AND EQ

A word about some of the parameters in the control section.

The envelope parameters Attack, Decay, Sustain, and Release refer only to the Amplitude Envelope. The Filter Envelope is not controlled with the knobs.

The EQ parameters within the function TONE 2 do not refer to the MASTER EQ. Rather, it is an additional EQ that is accessible by pressing F3 (EG/EQ) in the Voice Play mode.

This EQ allows a quick and intuitive correction of the entire Voice and thus represents an interesting alternative to the commonly used 3-band EQ as an insert effect or to the Element EQs.



The EQ in the Voice Play mode correlates the Part EQ in Performance and Mixing mode

With the exception of LOW and HIGH frequency, all parameters of the EQ can be controlled with knobs.

But you have to know that the settings of this new EQ are indeed stored with the Voice. But these are not effective in the Performance, Song, and Pattern mode. Here this EQ appears as Part-EQ, but it does not inherit the EQ settings of the Voice Play mode.

This behaviour should not be viewed critically, because it does make sense to re-adjust the equalization of the Voices in a new situation (Performance, Song, Pattern). The idea of a Voice that sounds exactly the same in any other mode as in the Voice mode, should have its limits here.

SLIDERS IN THE MIXING MODE

Since the MOTIF XS has eight sliders, the selection of the Parts is much easier than on the MOTIF ES. Instead of four groups you now just have to switch between two groups.

If the current Part belongs to the group 1-8, the sliders adjust the volume of the Parts 1-8. If the current Part belongs to the group 9-16, the sliders adjust the volume of the Parts 9-16. To toggle between these groups you just have to activate the TRACK button and use the number buttons to select either one of the Parts 1-8 or 9-16.

STORING THE SETTINGS OF THE KNOBS AND SLIDERS

Both the selection of the function group with the buttons SELECTED PART CONTROL or MULTI PART CONTROL and the positions of the knobs and sliders are stored in the Voices, Performances, Songs, and Patterns.

So it is quite possible to use the knobs and sliders for a so-called Easy Editing. However, caution is necessary here. Because if MIDI controller events from an external sequencer later change these parameters, the stored knob settings would be overruled.

In addition, the stored knob settings of a Voice are not copied when the Voice is used in Performances, Songs, or Patterns.

Normally, the knobs are more suitable for real-time control or temporary changes as for the programming of Voices.

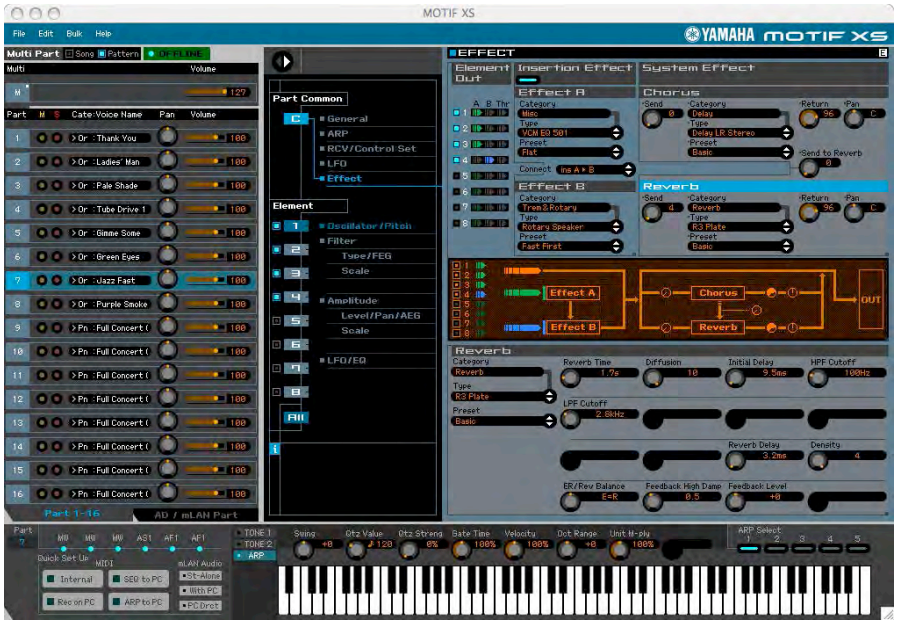
ASSIGNABLE FUNCTION BUTTONS

Left to the Master Volume slider the two ASSIGNABLE FUNCTION buttons can be found.

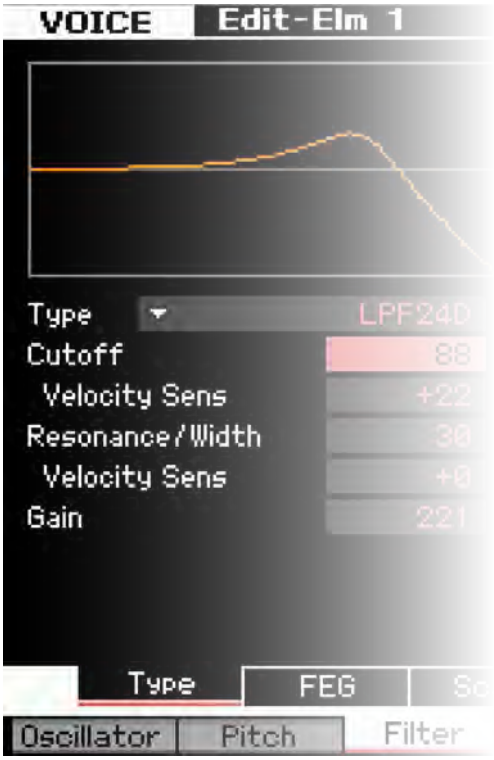
The assignment to these buttons is done in several ways from within the Voice mode.

For a start they can be assigned with parameters, just like the knobs assigns in VOICE EDIT - COMMON EDIT (F4 - CtrlSet). However, in contrast to the knobs a continuous control of a parameter is not possible here. When a ASSIGNABLE FUNCTION button is switched on, the Depth set in the Controller Set Assignment is immediately retrieved. The same applies to programmed „XA-Mode“ (Expanded Articulation mode) configuration of the Voice‘s Elements.

We‘ll talk about that in a later episode on Expanded Articulation.



PART 6: THE VOICE-MODE



FUNDAMENTALS

A Voice is the sound of a musical instrument that had been stored in an electronic musical instrument. There are two types of Voices:

- Normal Voices

- Drum-Voices

Normal Voices are pitched musical instrument sounds, synth sounds and sound effects. They can be played across the entire keyboard and in the usual tone scales and keys. Normal Voices consist of one or more „Elements" (see „Element").

Drum Voices contain drum and percussion sounds, each assigned to individual keys on the keyboard. A Drum Voice is also known as drum kit.

An Element is the most basic unit of a Normal Voice. An Element is produced by applying different voice parameters to the raw sample material. A single Normal Voice is combined from one or more Elements. With the newer models of the MOTIF series (from the MOTIF XS) up to eight Elements are available for Voices.

A Drum Key is the most basic unit of a Drum Voice. A Drum Key is assigned to a single key of the keyboard. Each Drum Key plays a drum or percussion sound (Waveform).

Voice Edit is a function to create your own Voices from the scratch or to edit existing Voices.

Common Edit contains the settings that apply to all Elements and Drum Keys.

Element Edit contains the settings for each individual Element of a Normal Voice.

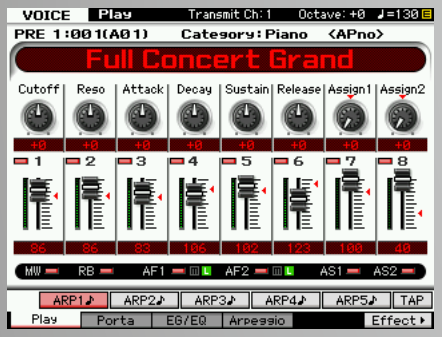
Key Edit contains the settings for the individual Drum Keys of a Drum Voice.

VOICE PLAY AND VOICE EDIT DISPLAYS

After entering the Voice mode, the Voice Play display is active.

Here the following functions are available:

- F1 – Play
- F2 – Porta
- F3 – EG/EQ
- F4 – Arpeggio



In the Voice Play display the PROGRAM button is activated by default. In this case the selection of Voices can be done using the Bank/Group/Number buttons. However, if the TRACK button is activated the Number buttons 1 - 16 are used to set the MIDI Transmit Channel. Activate the PROGRAM button to go back to the Voice selection mode.

PERFORMANCE CONTROL + MUTE + SOLO can not be used as long as the TRACK button is activated.

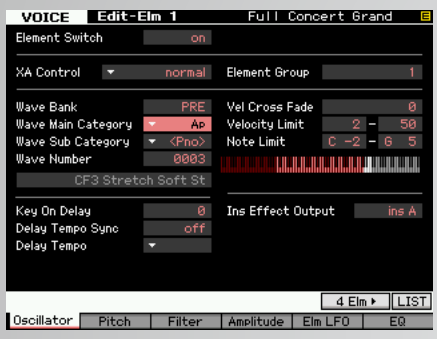
After switching to the Voice Edit display (by pressing the EDIT key) the Common Part is selected by pressing the COMMON EDIT button while the Elements 1 - 8 are selected by pressing the corresponding Number buttons 1 - 8. The TRACK button is initially activated automatically, even if the PROGRAM button was active in the Voice Play display.

When the MUTE button is activated, the Number buttons can be used to mute the corresponding Element 1 - 8.

When the SOLO button is activated, an Element can be selected for separate monitoring.

The buttons PROGRAM and PERFORMANCE CONTROL can not be used.

In Voice Edit display various functions are available for COMMON EDIT and ELEMENT EDIT, which will be discussed later.



THE VOICE BANKS AT A GLANCE

Prior to an intensive examination of the editing possibilities for Voices you should first get an overview of the available content.

The current top model MOTIF XF features twelve Normal Voice Banks with 128 Voices each, which can be selected using the BANK buttons within the VOICE mode:

- Preset 1 to 8
- User 1 to User 4

The Preset Voice Banks of the MOTIF XF are continuously sorted by Categories as follows:

- PRE1 = Piano, Key, Organ
- PRE2 = Organ, Cperc, Guitar,
- PRE3 = Guitar, Bass
- PRE4 = Strng, Brass
- PRE5 = Brass, SaxWW, SynLd, Pads
- PRE6 = Pads, SyComp, S.EFX,
- PRE7 = SyComp, S.EFX, M.EFX,
- PRE8 = M.EFX, Ethnic, Dr/Pc, Mega Guitar, Mega Bass, Vocoder

To ensure full compatibility with its predecessor MOTIF XS, the Preset Voice Banks 1 - 8 were adopted unchanged.

The User Voice Bank 1 contains 128 new Voices that are based on the new Waveforms and Arpeggios of the MOTIF XF.

The User Voice Bank 1 is thus the new Factory Bank of the MOTIF XF and should not be overwritten if possible, especially since the new factory Performances (USER 1) are mainly based on the new Voices of this Bank. Of course, the Bank is also sorted by sound Categories. Both instrument and synth Voices can be found there.

The User Voice Banks 2 - 4 only contain a „SHOWCASE" selection from the Voices of the Preset Banks. These Banks are therefore best suited for your own creations or optional Voice Banks.

In addition to the Normal Voices the MOTIF XF features 64 Preset Drum Voices and 8 User Drum Voices. The Preset Drum Voices are identical to those of its predecessor, the MOTIF XS, while the User Drum Voices (USR 001 - 008) contain new Drum Kits based on the additional Waveforms of the MOTIF XF.

CATEGORY SEARCH AND FAVORITES

Instead of Banks you can also use the CATEGORY SEARCH function to select Voices.

If CATEGORY SEARCH is activated, the Categories are selected with the corresponding BANK buttons. When a Bank button is pressed, a sorted list of all Voices in that selected Category is shown in the display. To choose from that list, use the Dial or the Cursor buttons. There are some Sub-Categories in each Category to further refine the categorisation.

The FAVORITES function plays a special role within the Category Search system. The Favorites can be set from within the Category Search. Simply press F5 Set / Clear for marking the Voice that's highlighted in the list shown in the display as a „Favorite" Voice. All available Favorites are shown by pressing the function button F4 - when the Category Search function is active. From this list you can remove Voices from the Favorites by pressing F5 Set / Clear again.

The FAVORITE list is a system setting and is retained even after switching off the instrument, but will be deleted if another All file is loaded. You can prevent this by selecting the file type „all without system". For security reasons you should save your own FAVORITE liste in a separate All file.

By the way: The Favorite list can also be used in the Song and Pattern mode for selecting Voices - if CATEGORY SEARCH was activated previously.

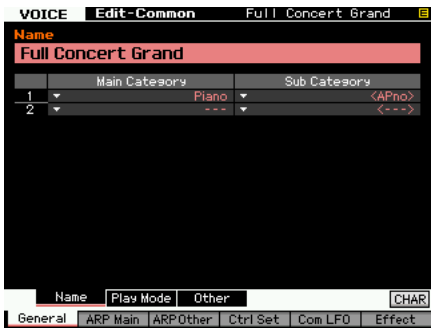
VOICE EDIT – FIRST STEPS

In Voice Edit screen, the Elements 1 - 8 can be selected with the Number buttons 1 - 8. The current Element selection is indicated by the lit LED in the corresponding Number button (1 - 8). The Elements used in a Voice are indicated by the LEDs of the Number buttons 9 - 16. These buttons can also be used to mute the Elements while the MUTE function is activated. Alternatively, with activated SOLO function, the Number buttons 9 - 16 select the Part (1 - 8) which is to be soloed.

Using Elements you can layer multiple sounds within a Voice.

As long as the COMMON EDIT button is not turned on while being in the Voice Edit display, the Element Edit mode is active.

In the COMMON EDIT mode global parameters such as Category, Voice Name, Volume, Arpeggiator, Effects, Control Sets, and Common LFO are available to be edited. If COMMON EDIT is activated, the functions for editing single Elements are deactivated.



If you want to program Voices by yourself or want to explore the impressive sonic resources offered by the extremely elaborately produced Wave-ROM of the MOTIF XF, you should first initialize a Voice and successively try all Preset Waveforms.

Before your start with programming your own Voices, you should initialize the Voice in order to start „from the scratch". To do so, select the JOB - Init - All Parameters (JOB - F1- ENTER - YES - EXIT). This Job results in an „Initialized Voice".

In an „Initialized Voice" only the first Element (EL1) is active, ie set to „ON". The other Elements are all set to „OFF". Start with this setting.

To hear the sound unprocessed by the Effects system, you should consider to set the Effects on bypass (EFFECT ON / OFF).

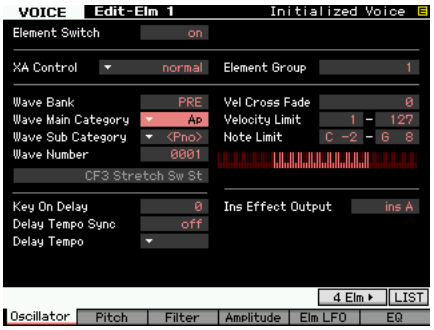
In an initialized Voice Element 1 plays the Waveform No. 1 (CF3 Stretch St Sw), a piano sample.

Press EDIT.

Use the parameter Wave Number in the Oscillator display (F1) to consecutively select and try all Preset Waveforms.

These are the multisamples or samples available in the MOTIF. Multisamples are mainly used for instruments and synth waves, ie a Waveform consists of several samples that are mapped to certain keys of the keyboard in order to make the sound more balanced. Sound effects or drum sounds usually use only one single sample for a Waveform.

Use the parameter Wave Main Category to select specific Waveform Categories.



While listening to the Waveforms you will very soon recognize that most multisamples only become a „real" sound, when they are combined with other Waveforms, or at least after they were processed by Filters, Envelopes, and Effects.

However, the synthesizer Waveforms (from no. 1,315) are often big enough to create fat and impressive sounds with only one Element.

VOICE COMMON EDIT – AN OVERVIEW

As described above, from within the Voice mode the EDIT button calls up the Common Edit mode. Common parameters, that have influence on the sound, will process all eight Elements. Further navigation is done using the Function buttons below the display. The main Function buttons F1 through F6 each have their own sets of Sub Functions, which are accessible using the Sub-Function buttons SF1 - 6.

Use F1 „General" to reach the first major sub-menu „Name", where you can edit the name and Category assignment of the Voice. To enter text in the selected field, press the button SF6 - „CHAR". The navigation within the text input is then assigned to the Function buttons or the Dial and all buttons below the Dial. SF2 - „Play Mode" brings you to important parameters such as Volume, Pan, Octave setting, and more.

The menus behind F2 and F3 combine all parameters which are relevant for the Arpeggiator of the Voice. The Sub-Function buttons are consistently assigned to the ARP-variants 1 - 5. A section in the lower third of the display, which is accessed via F2, separates between the parameters that are related to the Voice and the Arpeggioassociated settings. The parameter „Switch" in the upper area activates the Arpeggiator for the Voice. Other parameters determine the response of the ARPs on the played notes and define keyboard ranges. The Tempo and three other parameters are equally applied to all five ARP-variants. In the lower area the „ARP Type" is defined for each of the five variants. The parameters called up with F3 can be set and stored for each of the ARPvariants, too.

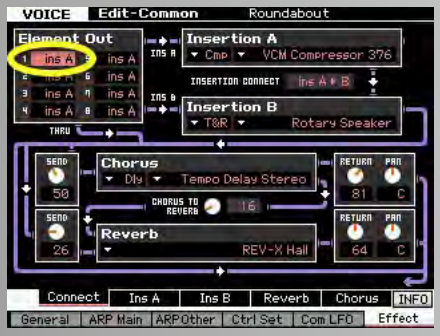
The button F4 calls up an important area for the discerning Voice programming. Here the

numerous controllers of the MOTIF series - like ASSIGNABLE FUNCTION, MODULATION WHEEL, etc. - are assigned to a parameter. Up to six sources are available for a myriad of target parameters, enabling you to render a extremely vivid performance with the Voice. The Presets also provide numerous examples of meaningful controller assignments.

F5 opens the display for the „Com LFO", which takes influence on the entire Voice

(Common). The parameter set of Common LFO is very extensive. You can also program your own LFO Waves. In addition, however, there is also a less complex LFO available for each Element of the Voice. And you can assign LFO parameters to controllers to create very effective and useful Voice modulations.

The high-quality Effects play a central role in the MOTIF. The Effect unit can be programmed in the Common Edit mode via the F6 button. A block diagram (SF 1 - „Connect") informs you about the signal flow through the Insert and System Effects.



In fact, here is an exception for the Common area, because you are able to set the assignment to the Insert paths for each Element of the Voice directly from this menu (see marking). The other Sub-Function buttons 2 - 4 are offering the parameter sets of the System and Insert Effects. We will discuss the Effects in detail in a later episode. For now only so much: Since the System Effects are only available once for the Voice, Performance, and Mixing mode you should use Insert effects for those effects that have a critical sonic impact on the Voice. Otherwise significant differences in sound will occur, if the Voice is used in another than the Voice mode.

VOICE EDIT – ELEMENT

With a push on one of the buttons 1 - 8 (Part Select) you can directly switch from the Common Edit mode to the Element Edit mode. Again, the five Function buttons are used to enter several menus including their sub-functions - for each Element.

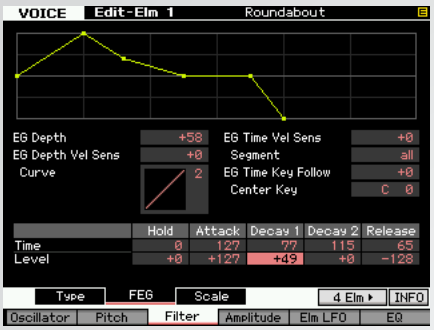
The page F1 „Oscillator" includes the main switch of the Element (on / off) and the access the basic parts of the sound generation. You can select the Waveform and a keyboard and velocity range here. The assignment to the Insert Effect - as described above for the Effect Block - can also be set here.

F2 „pitch" has everything to do with the tuning of the Element. The pitch can be coarsely set in 48 semitones and fine-tuned - divided into 63 „cents" -, both up and down. SF2 features the Pitch EG (envelope for the pitch).

The Filter - F3 - is one of the key tools for sound processing. If you want to get a feel for it, you should select one of the synth Waveforms (from no. 1,315) to make some experiments. In a first step you should disable the Effects and try the parameters „Cutoff" and „Resonance/Width" by making gradual changes, and experience the bandwidth that can be achieved with only one Element. A graphical representation of the Filter Curve visually supports the result that's to be expected.

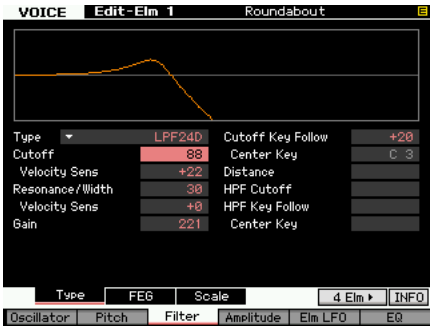
Many different Filter Types (Type) with some very special character expand the potential of sound processing. The Filter also features its own envelope generator (SF3 - FEG) with which the filter's effect can be influenced over time. For example, string instruments lose harmonic content in their decay phase. This can be simulated using the Filter Envelope. The last Sub-Function buttons opens the „Scale" menu, in which the effect of the Filter can be adjusted in relation to the keyboard range.

The next Function button F4 in the Voice Edit mode contains the Amplitude parameters. Here you are able to set the Volume of the Element, its adaption in relation to the keyboard range (Scale), the velocity settings, and the amplite envelope (AEG). The envelopes for Amplitude, Filter, and Pitch have the same basic structure - apart from some slight differences. Once you are familiar with this principle, you can master them in all areas. In addition, the graphical rendition of the envelope also supports the WYSIWYG principle (what you see is what you get).



F5 is assigned to the aforementioned Element LFO, F6 gives access to the Element EQ. Different EQ types with appropriate parameter sets allow a sound adjustment on Element-level, the smallest unit of sound generation. Separately programmable equalizers are often very helpful, especially when you are using several similar-sounding Elements within a Voice (as a Layer).

Use the Sub-Function button SF5 (4 Elm / 1 Elm) to toggle between the full-page view of parameters for a single Element and a list view of parameters for four Elements. This list view can provide a better overview to compare the Elements to each other. You can also comfortably change specific parameters for several Elements. With the rapid selection of Elements by using the Part Select buttons 1 - 8 and using the buttons and dial for data entry you can significantly reduce the time for setting parameters.



The Info button SF6 gives a quick overview of the most important informations on a Voice. These include, for example, storage location, name, number of Elements, and what Effects are used.

MEGA-VOICE-TECHNOLOGIE

The Mega Voice technology developed by Yamaha enables you to play ultra-realistic sounds thanks to an extremely complex multi-

sampling. Each Mega Voice consists of multiple multi-samples or Elements which heavily use velocity switches and key splits. The Mega Voices accommodate different playing styles and noises of the sampled instruments such as dead notes, hammer-on effects, ghost notes and strummings.

On the MOTIF XS the Mega Voices focus to acoustic guitars, electric guitars and basses. The Mega Voice technology was first implemented in the Yamaha Tyros.

Due to the complex structure of key and velocity limits Mega Voices are very difficult to play manually. Therefore special Arpeggio Patterns have been programmed to control the Mega Voices.

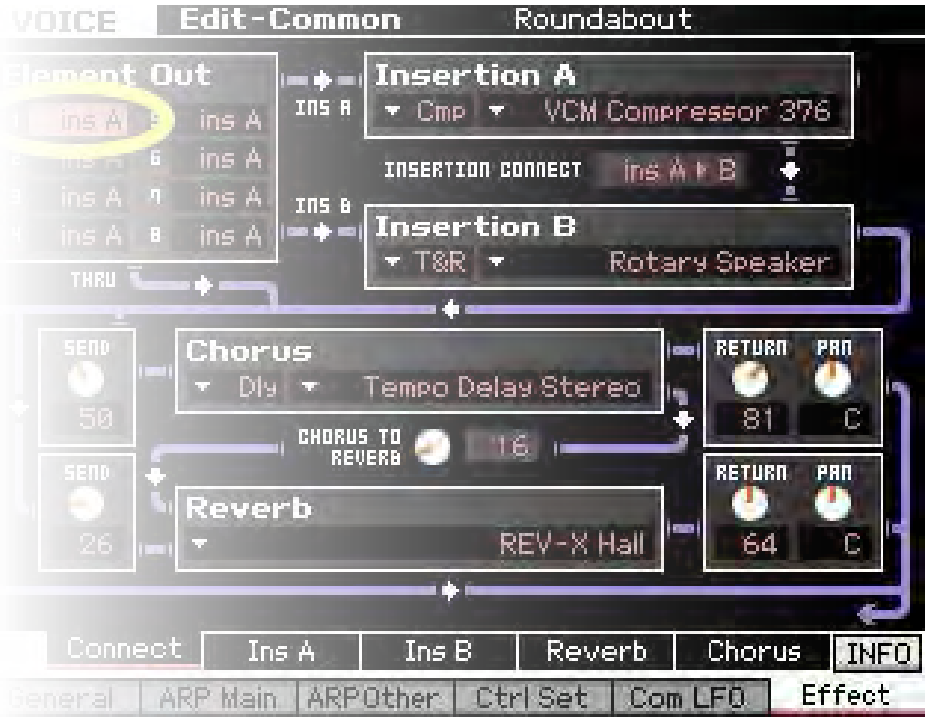
The Mega Voices are stored in the Preset Voice Bank 8 (081 to 124).

Examine the velocity zones and key splits to get an idea of the structure of the Mega Voices.

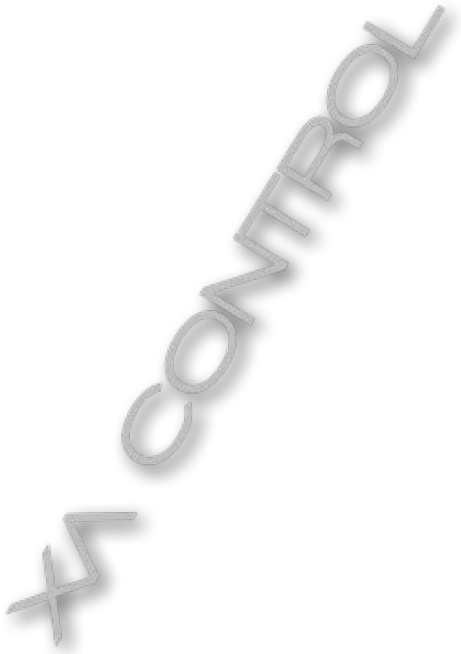
Use the Sub-Function buttons SF1 - SF5 to trigger the five Arpeggios that are assigned to the Voice.

COMING ATTRACTIONS

So much for the basic functions in the Voice mode. In the next episode we will take a very close look at a particular aspect of the MOTIF Voices, namely the Expanded Articulation.



PART 7: EXPANDED ARTICULATION AND MEGA VOICES



This episode is about a special aspect of the MOTIF's Voices. We will discuss the function of Expanded Articulation and the Mega Voice technology.

WHAT IS „EXPANDED ARTICULATION"?

„Expanded Articulation" is a sound generation system especially designed for the MOTIF synthesizers which allows greater flexibility and realism. It simulates playing techniques that are often used on acoustic instruments, but were difficult to implement in electronic keyboards - up till now.

So far, the „Expanded Articulation" feature is available in the following Yamaha synths:

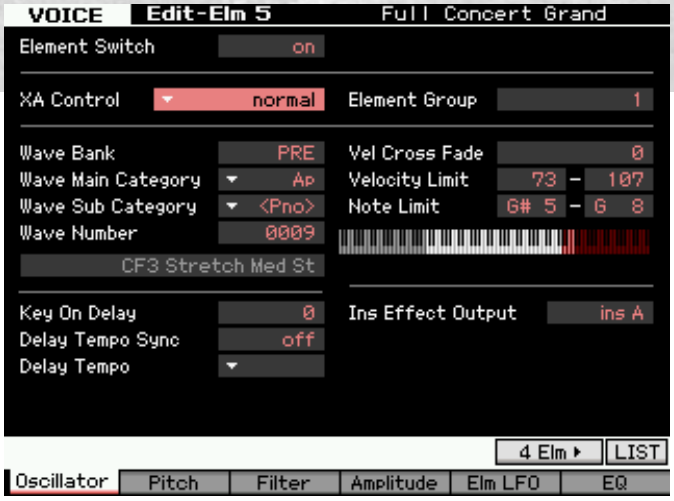
- *MOTIF XF*
- *MOTIF XF*
- *MOTIF-RACK XS*
- *S90 XS*
- *MOX6 / MOX8*

With the Expanded Articulation Mode („XA Mode"), the specific playing styles of instruments are imitated. In particular a realistic legato playing by switching the Waveforms, an authentic release with Key-Off samples and switching between different sounds with the assignable switches. Wave Cycle and Wave-Random functions exist, too. The operation of the XA Mode is similar to the „Super Articulation Mode" of the Tyros II. The XA mode could be realised when Yamaha decided to double the number of Voice Elements used in the synthesizers from four to eight. Another condition is the implementation of Waveforms that are specialised for the XA Mode technique (e.g. Key-Off Samples).

In the following all functions of the „XA Control" will be successively discussed and explained by Voice examples. Only the Elements which are not set to „normal" and thus take advantage of the „XA Control" are described.

The following steps will repeat for all examples discussed in this workshop - they are used to analyse the XA Control applications of the Voices:

- *Select VOICE mode*
- *Select the Voice given in the example*
- *EDIT - F1 Oscillator*
- *Use the TRACK button to browse through the Elements 1 to 8 used in the Voice and control the setting of the „XA Control" parameter. This parameter is crucial for the Expanded Articulation. The settings are normal, legato, key off sound, wave cycle, wave random, all AF off, AF1 on, and AF2 on. „XA Control" can be found in top of the display directly below the „Element Switch"*
- *Use the SOLO or MUTE function to individually analyze the Elements. The muting is done with the number keys 9-16 for the Elements 1-8*



XA-CONTROL „NORMAL"

This is the normal playing mode as we know it from synthesizers without Expanded Articulation. The Element is played normally with each keystroke. The XA Control is not applied for the Element.

All Voices converted from older models (such as the MOTIF ES) use „Control XA = normal" for their Elements.

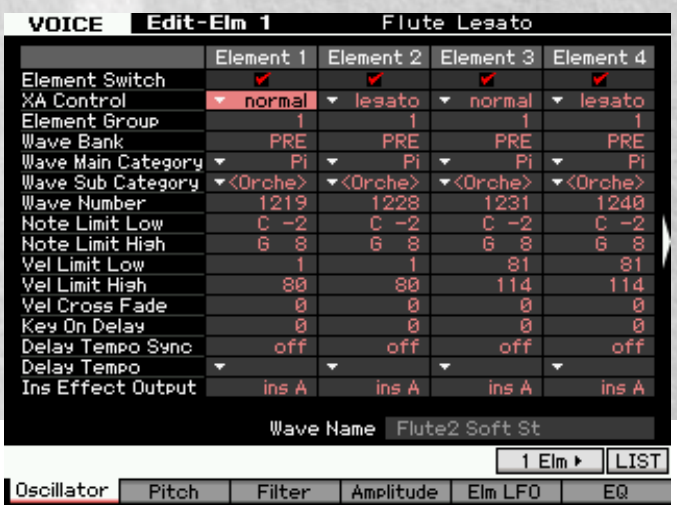
The subsequent editing and use of the XA functions is certainly a significant enhancement of existing Voices. One more reason to thoroughly read the information below. Only those who are able to use the Expanded Articulation in a sensible way can fully exploit the sonic possibilities of the MOTIF XS/XF.

XA-CONTROL „LEGATO"

Conventional synthesizers recreate a legato effect by continuing the volume envelope of a previous note on to the next one, in the mono mode. However, this results in an unnatural sound different from that of an actual acoustic instrument. The Legato function more accurately reproduces a legato effect by allowing specific Elements to be sounded when playing legato and other Elements to be played normally.

If XA control is set to „legato" for an Element, this will only be played in legato playing.

However the Play mode has to be set to „mono" (EDIT - COMMON - General F1 - SF2 Play Mode). So first the Elements which are set to „normal" are sounding. If subsequent notes are played legato, the Elements which are set to „legato" are sounding instead of the „normal" Elements.



Example: Pre5-017 (B01) Flute Legato

Element 2 = legato

Element 4 = legato

Element 6 = legato

Element 8 = legato

The Elements 1, 3, 5 and 7 are set to „normal".

To clearly hear the difference between normal and legato, you should mute the Elements 3 to 8. Now play with a low velocity, since the Elements 1 and 2 are set to sound in a velocity range of 1 - 80. Alternate between staccato and legato. You will hear that at staccato (= Element 1) the flute sounds with a blowing noise, while at legato (Element 2) the blowing noise is missing - just like on a real flute.

If you want to analyse some other „legato" Voices, you can recognize them by the addition of „legato" to their Voice name (eg Pre5-003, Pre5-005, Pre5-021, Pre5-022, Pre5-024, Pre5- 026).

XA-CONTROL „KEY OFF SOUND"

Conventional synthesizers are not good at realizing the sound produced when the note of the acoustic instrument is released. The MOTIF realizes the sound produced when the note of the acoustic instrument is released, by setting the XA Control parameter of a certain Element to "key off sound." The Element is then sounding whenever a key is released.

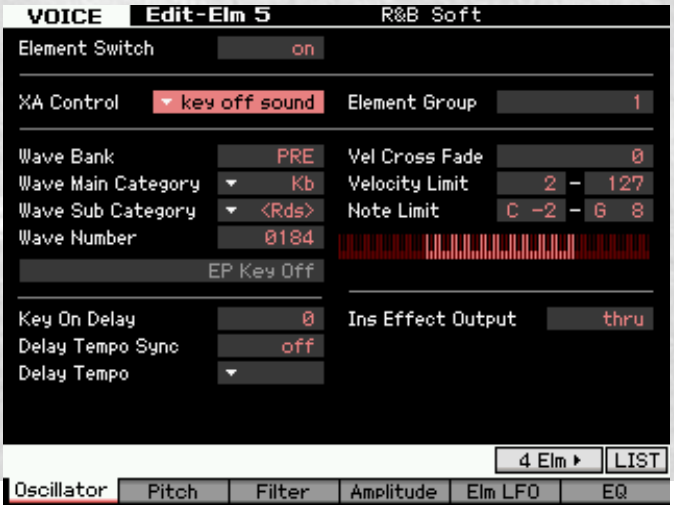
For the „key off sound“ special Samples have been integrated into the Wave-ROM, containing only the release sound of an instrument.

Use the SOLOor MUTE function to isolate the „key-off sound“. Turn off any Elements except for one the KeyOff is assigned to.

Example: Pre1-023 (B07) R&B Soft

Element 5 = key off sound

For the Key Off sound the Waveform „EP Key Off“ is used.



XA-CONTROL „WAVE CYCLE“ AND „WAVE RANDOM“

Conventional synthesizers attempt to reproduce subtle tonal variations by randomly changing the pitch and/or ?lter. However, this produces an electronic effect and is different from the real sound changes on an acoustic instrument. The MOTIF more accurately reproduces these subtle sound variations by using the XA Control parameter settings, “wave cycle” and “wave random.” These are not only useful for subtle tonal variations on acoustic instruments, but also for synthesizer sounds, as the following examples demonstrate.

If several Elements are set to „wave cycle“, each key stroke alternates between the wave cycle Elements in order of their numbering (when playing the first note, Element 1 is sounding, for the second note Element 2, etc.).

Example: Pre7-024 (B08) Find Newgt!

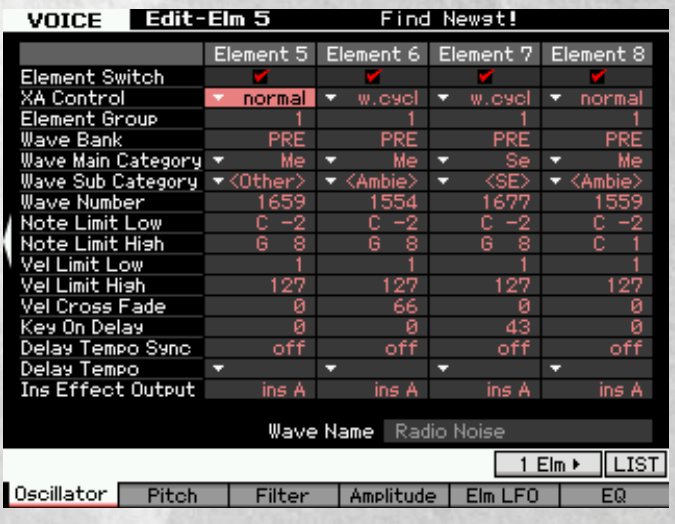
Elements 2, 3, 4, 6, 7 = wave cycle

The Elements 2, 3, 4, 6, 7 have different FX-Waves assigned to and are played alternately. In addition, the Elements 1, 5, and 8 are used. These are set to „normal“ and therefore played with each note.

Example: Pre7-092 (F12) Bed Time Story

Elements 2, 3, und 4 = wave cycle

The Arpeggiator is controlling the Elements 2, 3, and 4, which have different Bell-Waves assigned to and are played alternately.



In addition Element 1 is used. This is set to „normal“ and therefore played with each note.

If you select „wave random“ for several elements, with every keystroke the Elements are heard in a random order.

Beispiel: Pre5-086 (F06) Space Power Lead

Elements 1 - 4 = wave random, Element Group 1

Element 5 - 6 = wave random, Element Group 2

With „wave random“ the tone generator simulates analog synthesizers where the attack phase of an oscillator is different with every keystroke („free-running oscillators“ - see illustrations). The Elements are divided into two „Element Groups“, which each represent an oscillator. Both oscillators are detuned.

The two Groups (Elements 1-4 and Elements 5-6) are assigned to these four waveforms:

P5 SawUp 0dg

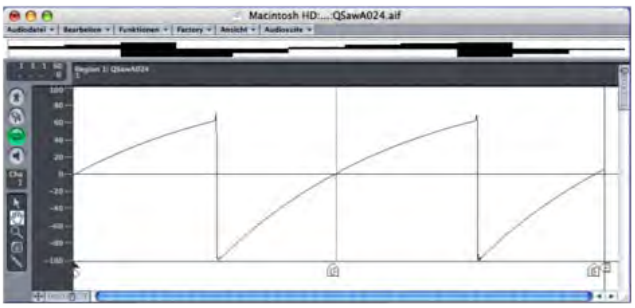
P5 SawUp 90dg

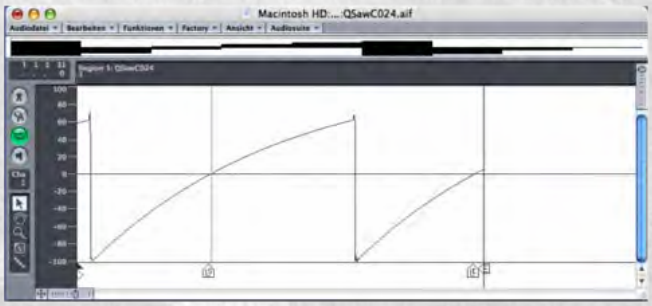
P5 SawUp 180dg

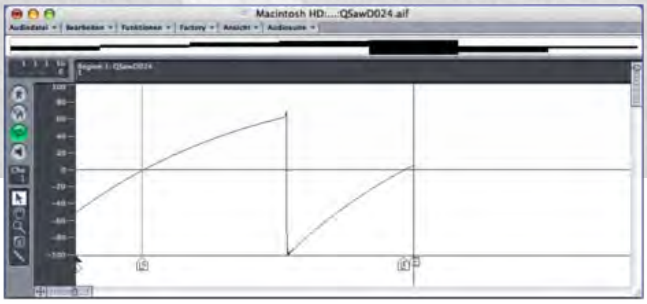
P5 SawUp 270dg

In principle these saw waves are identical (see below) - but their starting point differs. The effect results in two detuned saw waves with random starting phases, just like on an odd analog synthesizer.

With the XA function „wave random“ free-running oscillators are simulated, where the attack phase has a different form for each keystroke.







Here's a hint to the „Element Groups":

Elements can be assigned to one of the Element Groups 1-8. Basically Elements with the same XA Control mode should be in the same Group. In some cases - as in this example - it may be useful to set up several element groups.

Example: Pre6-107 (G11) Sixpack

Elements 1 - 4 = wave random

Elements 5 = AF1 on

Elements 6 = AF2 on

The Elements 1-4 are assigned with different analog synthwaves and are controlled by the arpeggiator. Due to the random selection of similar waves a very lively sound is achieved.

By using AF1 + AF2 two pad Elements can be added that are not controlled by the arpeggiator. This is made possible by the Arpeggiator setting „sort + direct" (Key Mode) in conjunction with a „Z.Pad" arpeggio. The Arpeggio only plays notes in the velocity range of 112 - 127. The Elements 1 - 4 are set to this range, too. However, the pads added with AF1/2 use the velocity range of 1 - 111

Example: Pre6-119 (H07) Freaky Loop and Pre8-012 (A12)

Elements 1 - 8 = wave random

The Elements 1 - 8 have different analog synthwaves assigned to and are controlled by the Arpeggiator. By the random selection of the different Elements the character of a Wavesequence is created.

XA-CONTROL „ALL AF OFF", „AF 1 ON", „AF 2 ON" („ASSIGNABLE FUNCTIONS")

The „Assignable Functions"(AF) allow you to switch between different sounds to reproduce the playing on an acoustic instrument.

Acoustic instruments have their own unique characteristics — even specific, unique sounds that are produced only at certain times in a performance. These include the flutter tonguing on a flute or playing high harmonics on an acoustic guitar. The MOTIF XS recreates these by allowing you to switch between the sounds while you play — using the ASSIGNABLE FUNCTION buttons and the XA Control parameter settings, "AF 1 on," "AF 2 on", and "all AF off."

But as with the previously described function the „Assignable Functions" are not only for acoustic instruments. Synthesizer sounds also benefit to produce interesting variation

The „Assignable Functions" work like this:

all AF off

The Element is disabled if one or both ASSIGNABLE-FUNCTION buttons are turned on.

AF 1 on

The Element is enabled if the ASSIGNABLE-FUNCTION button 1 is turned on.

AF 2 on

The Element is enabled if the ASSIGNABLE-FUNCTION button 2 is turned on.

Example: Pre1-086 (F06) Slow Jam

Element 4 = AF 2 on

ASSIGNABLE FUNCTION 2 = Element 4 („1st Four Draw") is activated

Example: Pre2-007 (A07) St. Paul AF1 & 2

Element 3 = AF 1 on

Element 4 = AF 2 on

ASSIGNABLE FUNCTION 1 = Element 3 („Pipe Organ1 St") is activated

ASSIGNABLE FUNCTION 2 = Element 4 („Pipe Organ2") is activated

Example: Pre2-015 (A15) Accordions AF1 & 2

Element 1 = All AF off

Element 2 = AF 2 on

Element 3 = AF 1 on

Element 4 = AF 1 on

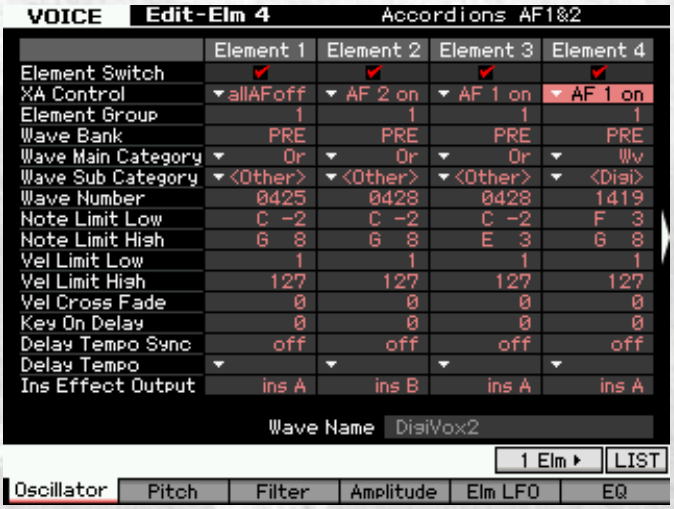
Element 5 = AF 1 on

Element 6 = AF 1 on

ASSIGNABLE FUNCTION 1 = The Element 1 („Accordion") is

switched off. The Elements 3, 4, 5, and 6 are activated

ASSIGNABLE FUNCTION 2 = The Element 1 („Accordion") is switched off. The Element 2 („Tango Accordion") is activated



Example: Pre2-030 (B14) Pop Bells & Pad MW

Element 1 = All AF off

ASSIGNABLE FUNCTION 1 = Element 1 („MedDetunedPadSt") is deactivated

ASSIGNABLE FUNCTION 2 = Element 1 („MedDetunedPadSt") is deactivated. In addition Elements 2 + 3 are played one octave higher and are applied with a vibrato. This is programmed in Ctrl Set (EDIT – COMMON – F4), not in the XA Control.

Example: Pre2-050 (D02) Classical AF1 & 2

Element 1 = All AF off

Element 2 = All AF off

Element 2 = All AF off

Element 4 = normal (Strumming-Effekt auf Taste C6)

Element 5 = key off sound

Element 6 = AF 1 on

Element 7 = AF 2 on

Element 8 = off (nicht verwendet)

ASSIGNABLE FUNCTION 1 = Elements 1, 2, and 3 are switched off. Element 6 („Nylon Slide St") is activated.

ASSIGNABLE FUNCTION 2 = Elements 1, 2, and 3 are switched off. Element 7 („Nylon Harmonics St") is activated.

While playing this Voice alternately press the ASSIGNABLE buttons 1 + 2 to get the slide effect and the harmonics. These are realized by switching on and switching off the Elements.

If AF1 is pressed, the Elements 1-3 are switched off, as they are set to „all AF off". At the same time Element 6 is turned on, because this is set to „AF 1 on".

If AF2 is pressed, the Elements 1 - 3 are also switched off. At the same time Element 7 is switched on, because this is set to „AF 2 on"..

Example: Pre2-081 (F01) Dynamic Clean AF1&2

Element 1 = All AF off

Element 2 = All AF off

Element 4 = AF 1 on

Element 5 = AF 2 on

ASSIGNABLE FUNCTION 1 = The Elements 1 and 2 are switched off. The Element 4 („Clean Mute") is added

ASSIGNABLE FUNCTION 2 = The Elements 1 and 2 are switched off. The Element 5 („Clean Slap") is added

For the settings „all AF off", „AF 1 on", and „AF 2 on" you have to keep in mind, that the function of the ASSIGNABLE FUNCTION 1 + 2 buttons may vary. Their function can be set in VOICE - EDIT - COMMON - F1 General - SF3 Other using the parameters „A. Function 1 Mode" and „A. Function 2 Mode". Here you can decide, whether the AF buttons should function as latching or as a momentary switches. When set to „latch", pressing the button toggles between on and off, which is indicated by the LED of the button. When set to „momentary" holding down the button switches on, while releasing it switches off.

It is also important to know that AF1 + AF2 not only depend on the XA Control settings of the Elements. Additionally or alternatively they can have a parameter assigned to from the Control Set (VOICE COMMON).

If you want to analyze further XA Voices which use the ASSIGNABLE FUNCTION 1 + 2, you can recognize them by the „AF1&2" in the Voice name..

MEGA-VOICE-TECHNOLOGIE

The Mega Voice technology developed by Yamaha enables the creation of ultra-realistic sounds thanks to an extremely elaborate multi-sampling. Each Mega Voice consists of several multi-samples or Elements combining velocity switches and key ranges. The Mega Voices accommodate different playing techniques and noises of the sampled instruments such as dead notes, hammer-on effects, ghost notes and strumming.

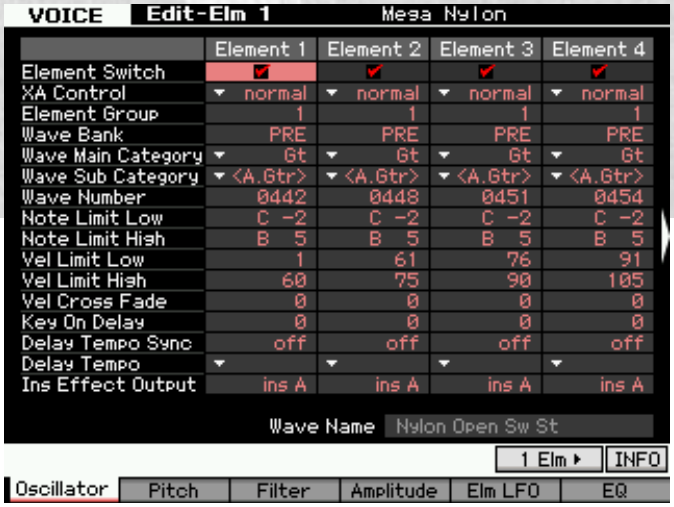
On the MOTIF Mega Voices focus on acoustic guitars, electric guitars and basses. The Mega Voice technology was first realized in the Yamaha Tyros.

Due to their complex structure of keyboard and velocity limits Mega Voices are very difficult to play. Therefore, special arpeggio patterns have been programmed to control the Mega Voices.

You can find the Mega Voices in the Preset Voice Bank 8 (081 to 124).

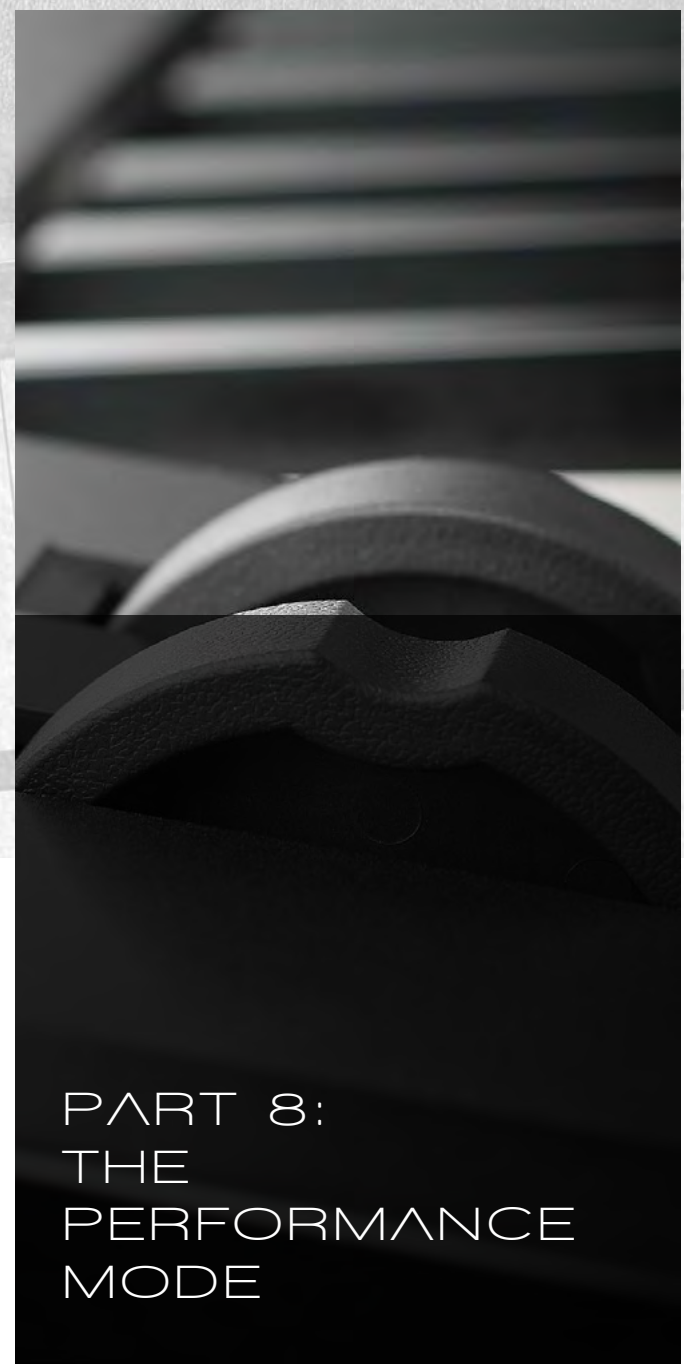
Try the velocity zones and key splits to get an idea of the structure of the Mega Voices..

Use the sub function buttons SF1 - SF5 to select from five Arpeggios assigned to the Voice.



You can also set other Arpeggios from the Voice Edit mode (Common / F3 ARP). The Mega Voice Arpeggios can be found in the Categories „GtMG" (guitar) and „BaMG" (bass).

So much for the special functions in the Voice mode. In the next episode we will take a closer look at the Performance mode of the MOTIF.



PART 8: THE PERFORMANCE MODE

HOW DID THE PERFORMANCE MODE GOT ITS NAME?

In the MOTIF Music Production Guide 02-2012 the basic concepts have already been explained. The Performance mode was also discussed in that part. According to a great internet portal, the term „Performance" has many explanations. Our particular application is probably pretty close to the artistic performance, without that we necessarily have to involve artistic standards. But with the help of a Performance of the instruments described here you can simply „perform" your music. The following will describe the preconditions which are to be established to do so. The key advantage of a Performance is to have direct access to as many controls and parameters during live playing, without having to go into deeper menu structures. This results in a limitation right at the beginning: There is no Performance mode in the MOTIF-RACK XS.

PERFORMANCE PLAY MODE

Performances are organised into User Banks of 128 storage locations. None of the instruments mentioned here feature Performances as Presets. So if you adjust a Performance according to your wishes, you are forced to overwrite an existing Performance. If you do not want to lose the original, it makes sense to watch out for potential „free" memory locations when exploring the factory Performances.

Of course, if necessary every instrument can be restored to its factory settings by doing a factory reset.

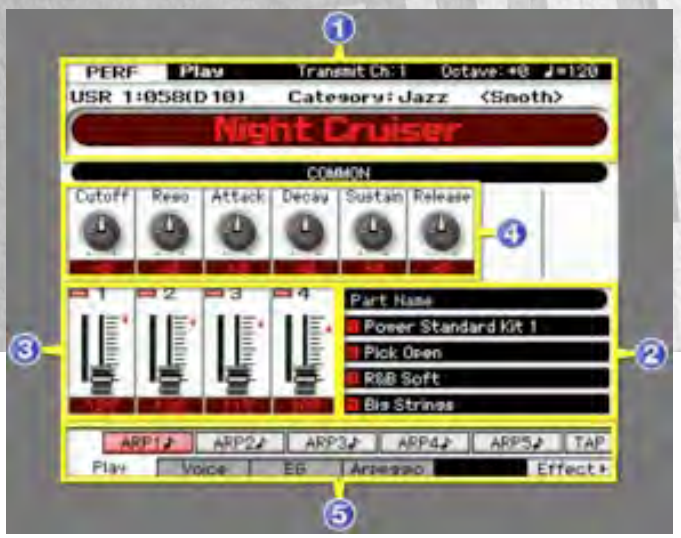
No rule without exception: On the S70/90 XS the fourth Performance User Bank is empty at default to immediately provide free memory slots for your own creations. The Performance storage capacity varies from instrument to instrument:

- *MOTIF XS – 3 User-Banks*
- *MOTIF XF – 4 User-Banks*
- *S70 XS / S90 XS – 4 User-Banks*
- *MOX6 / MOX8 – 2 User-Banks*

As already mentioned, the Performance Play mode is ideal for a typical live situation. Whether as a solo artist or in a band context. In a normal Performance four Voices can be combined. It is possible to set up Layers (one sound above the other), Splits, or Velocity Switches and Velocity Crossfades. Many Performances use arpeggios for rythmical accompaniment.

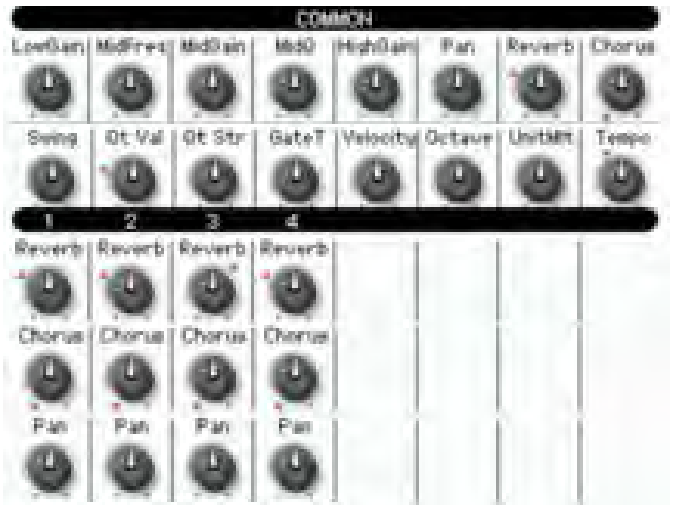
SO YOU DO NOT LOSE TRACK

The display - here of the MOTIF XF as an example - gives comprehensive information about the structure and thus the possibilities of the currently selected Performance. The overview display can roughly be divided into five areas. Area 1 provides information on the name and the memory location of the Performance and its musical style. The areas 2 and 3 show at a glance how many active Voices are included and what type they are. In addition, the areas 3 and 4 reflect values of the shown parameters in real time and react to the movements of the faders and knobs. In area 5, the five ARP types can be selected (buttons SF1-SF5). The buttons [F1] to [F6] are used to select other screen contents.



Using the [SF6] button it is possible to set the tempo using the tap function.

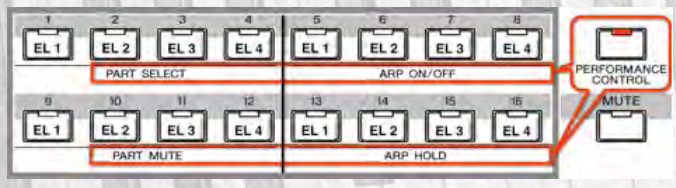
Area 4 shows which parameters are accessible by the respective knobs. However, the detail shown represents only one of the possibilities. With the help of the [SELECTED PART CONTROL] and [MULTI PART CONTROL] buttons next to the knobs, more parameter sets can be called. The screenshot below shows a summary of these parameters.



The title above the respective parameter string is of crucial importance. It indicates whether the knobs affect all (COMMON) or just individual Parts (1-4) of the Performance. So far this reference is only set by the parameters that are associated to the buttons mentioned above.

EVERYTHING UNDER CONTROL

But there is another important button in this context. It's called [PERFORMANCE CONTROL] and is found to the right of the numeric keys of the program selection. By activating this button, the number buttons 1-16 are assigned to the functions specified under them. Each based on the Performance`s Parts 1-4.



Performance Control could almost be counted as a sub-mode of the Performance Play mode. Use the buttons 5-8 to switch the arpeggios for each Part on or off, independently from the stored status. The buttons 9-12 can mute the individual Parts. The buttons 13-16 determine whether the Arpeggio assigned to the Part continue to play after releasing the notes of the keyboard (Hold) or not.

We have deliberately placed the buttons 1-4 at the end of this description. Regarding the parameter mapping in terms of affecting (COMMON) or (Part 1-4) as described above, the operating concept is continued here consistently. To the left of the numeric buttons you can find the [COMMON] button (which you should already know from the Voice mode), which is activated after the first selection of a Performance. If [PERFORMANCE CONTROL] is active (!) you can switch from [COMMON] to the single Parts by using number buttons 1-4, to have access to the same parameters shown in area 4 of the Performance Play screen (Cutoff, Reso ...) - but now they don´t affect all Parts of the Performance (Common), but explicitly the currently selected Part.

SHORT RÉSUMÉ?

In short, we are still in the Performance Play mode. Nevertheless, access to switch Parts, to control the Arpeggios and a large number of parameters is guaranteed. The latter both for the overall Performance, as well as each individual Part. Plenty of options to add rich variety to your personal presentation way beyond the musical content and your playing technique.

And of course it is OK to use these parameter ontrolling possibilities as shortcuts to adapt a Performance to your needs. For the largest part of the editing process you would naturally use the Performance Edit mode, which is described in the following. However, you are also able to store the changes made directly from within the Play mode by hitting the [STORE] button.

A SMOOTH TRANSITION...

... to the Performance Edit mode takes place through the function buttons F1-6. While still in the Play mode you can use the button [F2] to get an overview of how the Parts are distributed over the keyboard. Moreover, you can select other Voices here and influence the keyboard zones, too.

[F3] (EG) shows the same as area 4 in the first image, while [F4] (Arpeggio) is the counterpart of [F2], but for the Arpeggios. You select and activate Arpeggios for the five variants that are available. The selection of Arpeggios, as usual, is possible using the Data Entry button and the dial. With several thousand Arpeggios it is also very useful to use the [CATEGORY SEARCH] function to select them from a list view.

The function key [F6] (Effect) switches into the Performance Common Edit mode. Like in the Voice mode you can select System Effects and adjust their levels as well as toggle the Insert Effects for the Voices on or off [SF2]. In addition, each System Effect (Reverb/Chorus) has its own Edit Page [SF3/4] for the fine-tuning of the effect settings.

PERFORMANCE EDIT MODE

The Performance Common Edit mode is exhausted with the effect settings. All other parameters are related to a Part. By pressing the [EDIT] button you can switch from Common Edit to Part Edit and a specific Part. Doing so assigns other functions to the Function buttons below the display.

The [F1] button opens the display that is showing the parameters which are relevant for the Voice of a Part. Here you can select a Voice and set its Volume, Pan, transposition (Note Shift) and detuning. Using the Velocity and Note Limit parameters you can determine the corresponding zones the Part responds to. So, here the limits are to be set if you want to distribute the Voices in splits over the keyboard. The option „Param. with Voice" (on/off) decides whether various parameters of the original Voice are valid or not. This relates to the EG, Filter, Note Shift and more. The Subfunction button [SF2] calls up all relevant output parameters, including the Effect Level for the System Effects and the activation/deactivation of the Insert Effect. „Other" [SF3] lets you set the Pitch Bend Range and a Velocity Curve to adapt your playing on the keyboard to the individual Part.

Use [F2] and [F3] to reach all parameters relating to the Arpeggios, from the choice to the definition of the Key Range, Tempo, etc. to specific settings concerning the Quantization. [SF1] to [SF5] are, like in the Performance Play mode, used to select the five ARP variations. Settings for the Envelope (EG) and the Equalizer (EQ) are available using the buttons [F4] and [F5]. The last page of the Part Edit section is [F6] and contains all controller assignments for the Part. You can selectively switch controllers so that the Part - as you wish - either responds to them or not.

In Split Performances two (or more) Parts are set to work independently in different keyboard Zones. Originally, the controllers (modulation and pitch bend wheel, sustain pedal, ribbon controller, etc.) are assigned to control all four Parts. However, this can lead to unwanted side effects.

Here are four examples with standard combinations:

(1) „Rhodes-Strings“: The electric piano is to be played the left hand and held sustained with the pedal, but not the strings. Disable „Sustain“ for the strings Part on the corresponding display page

(2) „Bass-Piano“: The bass sound should not be blurred by the pedal - turn „Sustain“ off for the bass Part

(3) „Pad-Lead“: The pitch bending for the lead Voice should not affect the pad sound. So „Pitch Bend“ should be switched off for the synthpad Part

(4) „Piano-Pad“: The foot controller (FC7) should only control the volume of the pad Part. Disable „Expression“ for the piano Part

However, it is not the objective of this synth guide to explain each parameter in detail here.

CREATIVE CORNER

A special highlight is the ability to record complete Arpeggio arrangements with a push of a button directly from the Performance mode. This procedure is called „Direct Performance Recording“. The actual recording is done in the Song or Pattern mode. All Voice and Arpeggio settings are automatically copied from the Performance. It is therefore not required to make various settings in advance in the Song or Pattern mode to keep hold of spontaneous musical ideas on the basis of the many inspiring Performances.

„Performance Recording“ in single steps:

- *Enter Performance mode*
- *Select the Performance USR1 - 012 (A12) „Double Dip the Funk“*
- *Press the [RECORD] button to open the „Performance Rec Setup“ display“*
- *Select „Song“ as Sequencer Mode*
- *Activate „Key On Start Switch“. An arrow appears next to the keyboard symbol. The recording is started as soon as the first note is played*
- *Play your chord progression and/or melody, without pressing the [PLAY] button beforehand (you can add a metronome click using [F5])*
- *Stop the recording*
- *Enter the Song mode*
- *Press [PLAY] to start the playback of your Song*

All Performance settings are automatically copied to the destination Song during recording. After the recording a complete Song with four Tracks/Parts including the Mixing settings is available as a result. The same procedure is applied with a „Pattern“ as destination. In particular, when a musical idea is still unfinished both technically and in terms of arrangement, the Pattern destination is the more correct choice. This way you can record small takes of only several bars and arrange these Patterns in any order later. Finally, the result of that arranging process can then be copied into a Song using a Job.

PERFORMANCE CREATOR

The S70/S90 XS introduced the Performance Creator, which was also adopted in the MOX. It‘s purpose is the easy and fast configuration of typical Performance requirements, such as layering and splitting sounds across the keyboard. Inbetween the buttons for the different modes and the bank selection the three buttons for the Performance Creator are located. Some practical examples should help to fully understand the function. Following the order of the buttons from left to right we begin with [LAYER]. In a Performance, it is possible to layer up to four Voices on top of each other.

The starting point of the following examples - on the MOX - is the Voice mode. First, we want to remind you of the [CATEGORY SEARCH] function again. Using the [INC]/[DEC] buttons or [DIAL] wheel you can navigate through the Categories, but the quickest way is the direct selection via the keypad. Below the buttons [A] to [H] the different Instrument Categories are listed in two lines. The second line is activated by pressing the appropriate button twice. Thus, there are 16 Categories of instruments from „Piano“ to „Ethnic“ available.

Of course, you are totally free to choose which Voices you want use for your layers. However, for the rest of this first example it would be advantageous to choose at least Voices from the Categories that are used in this example. So if you want to reconstruct the following example, follow these steps:

For Part 1 (P1):

- *Enter [VOICE] mode*
- *Press [CATEGORY SEARCH] and then [B] (KEYBOARD)*
- *Use the cursor [►] to call up the list view*
- *Select PRE1 B07 – „R&B Soft“ ([INC] or [DIAL])*
- *Press [ENTER]*

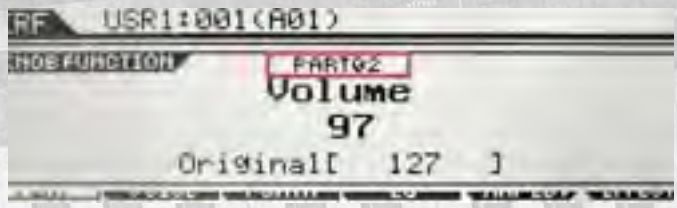
Pressing the [LAYER] button, the following actions are triggered at the same time: The mode automatically changes from Voice to Performance, the [LAYER] and [CATEGORY SEARCH] buttons will flash and the display will change to the Voice selection for the layer. The instrument „recommends“ a Category, in this example „Strings“. The first Preset Voice from that Category is automatically layered together with the electric piano sound across the entire keyboard. However, we want to use a pad sound for this example:

For Part 2 (P2):

- *Press [LAYER]*
- *Main: Press [B] two times to select (PADS)*
- *Use the cursor [▼] to select „Sub“*
- *Press INC twice to select <WARM>*
- *Use the cursor [►] to call up the list view*
- *Select PRE5 H13 „Nu WarmPad“ ([INC] or [DIAL])*
- *Press [ENTER]*

The display changes to the „New Performance“ that you just have created, without trying an Edit mode for that. Now you have the option to save this new Performance using a different name. Any adjustments, for example the Volume of Parts can be achieved

without invoking the Edit mode. Simply enable [PERFORMANCE CONTROL], select Part 2 using [PART SELECT] and press the button left of the top row of the „ASSIGNABLE KNOBS“ until the LED for „TONE 3“ is lit. As soon as you move the first Knob for „VOLUME“, the display automatically switches to the appropriate display.



PERFORM NOW!

At this point it is time to close once again and spend time making music with the instrument. We hope to have brought you closer to the Performance mode. It is very versatile to use, for live situations, using Arpeggios as a creative pool and as the basis for music production. It‘s always a good idea to analyse the existing factory Performances for learning purposes. They are suitable as starting points for your own Performances, so you can avoid a start „from scratch“ from an initialized Performance.

Have fun exploring!

PART 9: THE SONG MODE

PLAY A SONG FOR ME...

In part 3 of this Yamaha Synth Guide we already introduced you to the concepts of Songs and Patterns. Based on a small example it was explained how to create a Song from a Pattern Chain. It might help you to re-read this part.

In the course we will be building on that concept. To get started, here's a short summary of that said paragraph: A Song can contain up to 16 Tracks. These are available in parallel, just like in current sequencer programs (DAW) or earlier multi-track tape machines. Whether these Tracks are created from a Pattern Chain, if they are recorded live Track by Track live or imported from a finished Song in Standard MIDI file format does not alter this structure. The maximum capacity of the sequencer area (Patterns and Songs in total) is limited. The maximum number of notes depends on the model.

MOX / MOXF: 226,000 notes

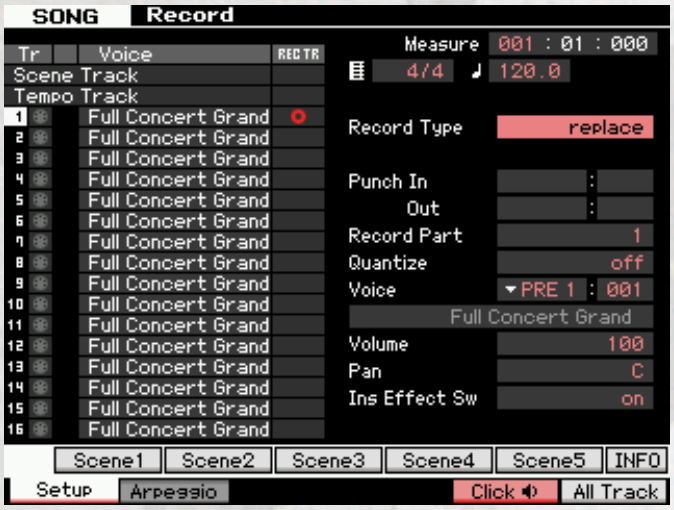
MOTIF XS / XF: 130,000 notes

It must be considered, however, that events such as aftertouch, pitch bend, and modulation wheel can significantly reduce the capacity when they are used intensively. In their delivery status - which can be reproduced any time by a factory reset - the instruments contain Demo Songs that not only are suitable as a demonstration of the instrument, but also illustrate the possibilities of the Song mode.

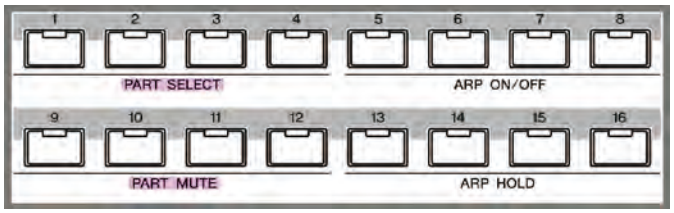
The S70/90 XS does not feature a sequencer or Song mode in the conventional sense. We will come back to its possibilities in a separate section.

QUIET PLEASE: WE'RE RECORDING!

Suppose you want to capture a musical idea which requires a couple of Tracks, but does not fit into a Pattern scheme. And you want it as quickly as possible, without long preparations. For this purpose, the Song mode is ideal. After its activation and, if necessary, the selection of a free Song, hit the Record button. Here you will find all the important settings at a glance.



There are important specifications that affect the entire Song, such as Time Signature, Tempo, Record Type, etc. You also have the opportunity to directly select a Voice for the Track in question. This is transferred to the Mixing when the Song is saved. By this you don't have to toggle between Mixing and Song Recording and ruin your inspiration flow. After you made your settings you can immediately start recording your ideas. Activate the [TRACK] button and use the number buttons to select the Tracks/Parts you want to prepare or record on.



Deviating from the known Pattern mode, there is no Section Length in the Song. The recording of each Track is analogous to a multi-track tape machine. Here the available „Record Types" are of great importance. There is the choice to Replace any existing recording on a Track when re-recording, or supplement it by a further recording (Overdub). If you have made a mistake you can be selectively choose an area (eg a bar) inside the Track, where the recording is automatically started and stopped again with „Punch". You can start playing before the punch-in marker, since the recording takes place only within the specified limits. Recordings that fit well into a exact time grid and perhaps should follow a very precise timing can already be quantised in the recording process. Each recorded note will be adjusted to the selected grid.

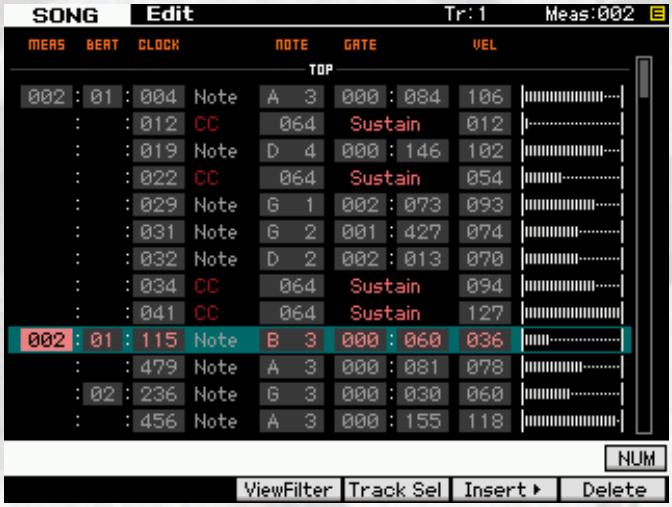
Here's a tip! The option to include Arpeggios in the Song mode is very interesting. After pressing the Record button you can alter the Arpeggio settings using [F2]. Suppose you want to quickly create a professional-sounding drum track. From the Song Record mode you should first activate „Voice with ARP" in the Arpeggio menu page. This ensures that a Drum Kit is loaded which is matching the Arpeggio. Then select the drum groove you want to use in your Song from the ARP category „DrPc". Change the settings „Switch" and „Hold" to „on", activate the Arpeggio button on the instrument's control panel and start recording. You only have to play a note and the groove starts to play until you stop recording. Let the main groove go through to the end of your Song.

The drum Arpeggios are known to contain some nice fill-ins. The record mode „Punch In / Out" for example is well suited for the integration of fills. With the selection of the Arpeggios you should determine whether the fill is played over one or two bars. Then set the markers for the Punch accordingly and start recording. You can start to play before the punch-in marker starts the actual recording. By doing so you can check if you have started the fill synchronously with the already recorded groove. If not, you have the option to cancel the recording and try again. Otherwise, keep your Arpeggio drum fill playing until the punch-out marker is reached and then stop the recording. Even longer parts of a Song can be provided with alternative drum ARPs. This way you can gradually work out a drum track that sounds very varied and realistic.

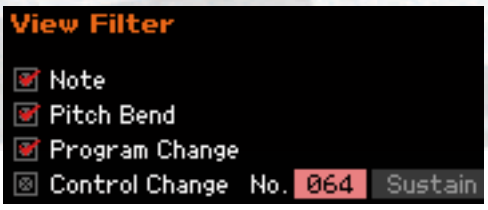
Of course this procedure is not limited to drums. Also, consider the ability to post-process the generated Tracks later in your DAW based on their MIDI data.

POST RECORDING

There are also extensive post-processing options available besides all those common settings. For instance, the quantisation mentioned above. If you made a recording without quantisation, but are not satisfied with the timing of some notes: it's easy to correct them. You can place each note exactly where it belongs. Of course, this is not limited to the starting point - the note length can be influenced, too. The detailed possibilities to influence the events are of course also available for other recorded events, such as controller data. For example, you can correct a misplaced pitch bending without having to repeat the entire recording of a Track. However, it is somewhat more time-consuming to post-edit data-intensive controllers, so you should decide case by case whether you edit or re-record.



To facilitate the overview, you can use the so-called ViewFilter to specifically hide notes or certain types of events. So you can focus on the event type you are trying to edit.

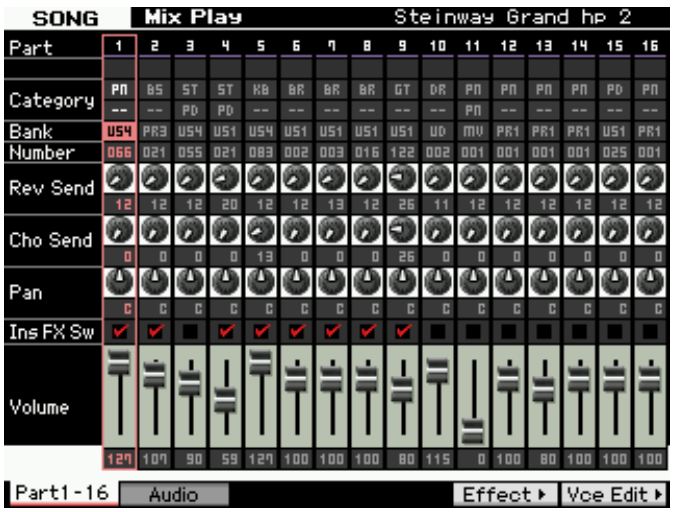


Once you have invested time and creativity it's - like always - advisable to store the current state. Simply press the [STORE] button. The Song thus stored is retained even after switching off the instrument. Those who want to be more careful with their time-consumingly acquired results also save the current state in an ALL file on a USB stick and secure its contents on a computer or alternative storage media.

FIX IT, THEN MIX IT

During recording, you have a very convenient access to the volume of the Parts by using the eight Faders. The Faders are either assigned to the Tracks 1-8 or 9-16, depending on which Track is enabled via the [TRACK] button. The full extent of the Mixing can be entered with the [MIXING] button.

Here, you can conveniently select sounds and adjust effects, edit and set the panorama position of a Track. It is even possible to enter the Voice Edit mode, where you have access to all parameters of a Voice. If at this point you like to adjust a Voice for the needs of that special Song only, you can store it as a so-called Mixing Voice. Each Mixing contains 16 slots for Mixing Voices. These Voices do not burden the „normal" user memory, and they are quickly accessible from within the Mixing. Even if you, for example, want to compare them during your session with a different Voice from the User or Preset memory. All parameters and values set in the Mixing are saved with the Song.



IN DETAIL: THE MIXING MODE

Each Song has its own Mixing settings that are invoked along with the Song. The most important Mixing settings such as volume, pan, and effect sends, as described above, are available in the form of a mixing desk from the Play mode. Even the Knob settings are effective in the Mixing mode. The other Mixing parameters are accessible from within the Edit mode.

The COMMON EDIT button selects the COMMON Part, in which the following settings are summarized:

Various global settings [GENERAL]

Master Equalizer [MEQ]

Master Effect [MEF]

Controller Assignment [CTLASN]

Audio-In Part [AUDIO IN]

Effects [EFFECT]

Use the number buttons 1-16 to select the Parts 1-16 in the Mixing Edit mode. For each Part an extensive rich set of parameters is available, identical to the Parts of a Performance. The Mixing settings become integral parts of Songs and Patterns by performing a Mixing Store.

With the Mixing Job [F5] (TEMPLATE) all current Mixing settings of a Song or Pattern are stored [SF5] (PUT) in a Template, which can be retrieved for any other Song or Pattern using [SF4] (GET). In this way, Mixing setups can be copied quickly and comfortably between Songs and Patterns. The Templates are even retained after switching off the instrument. The Mixing Job [F3] (Copy) - [SF3] (Perf) copies the complete settings of a Performance to the corresponding Mixing Parts (Common + Parts 1 to 4). The Arpeggio settings of Performance Parts are just as much copied as the assignments of the Arpeggios to the sub-function buttons [SF1] - [SF5] (ARP1 - ARP5).

The five assigned Arpeggios ARP1 - ARP5 can be used within the Song mode in several ways:

- *In the Mixing Edit mode (ARP1 – ARP5)*
- *In the Song Record mode – [F2] (Arpeggio) (ARP1 – ARP5)*
- *In the Song Play mode (Scene 1 – Scene 5)*

The latter possibility (the Song Play mode) requires an additional procedure after „Performance Copy", that stores ARP1 - ARP5 as Scenes 1-5. Here are the steps to accomplish this:

- *SONG – RECORD (= Standby mode)*
- *[F2] (Arpeggio): Select [SF1] (ARP1)*
- *[F1] (Setup): Hold the [STORE] button+ [SF1] (Scene 1)*
- *„Scene stored" is shown in the display*
- *[F2] (Arpeggio): Select [SF12] (ARP2)*
- *[F1] (Setup): Hold the [STORE] button + [SF12] (Scene 2)*
- *„Scene stored" is shown in the display*
- *Repeat these steps for ARP 3 – 5*

IN DETAIL: MIXING VOICES

In Songs and Patterns up to 16 Mixing Voices can be stored. Up to 256 Mixing Voices can be managed in total. Mixing Voices are Normal Voices that are not stored in the User Voice Banks, but are an integral part of the Song or Pattern and are stored together with them. This feature enables the simultaneous processing of up to 16 Voices of a Song or Pattern with all Voice parameters, ie with „Full Edit"! Mixing Voices can be generated from Normal Voices only, Drum Voices or Sample Voices can not be stored as Mixing Voices. The 8-Zone Drum Voices are the exception to that rule, since these are Normal Voices, in which the eight Elements are used to render drum sounds. They are some sort of miniature Drum Kits. So if you need special drum sounds for a Song or Pattern, you should focus on these Voices. If you don't find the appropriate drum sound in one of these Voices, simply select another „Wave Number" from [F1] Oscillator to select any drum sound for the active Element. As already mentioned, you can edit multiple Mixing Voices simultaneously. So you do not necessarily have to [STORE] your settings when you want to leave the Mixing Voice Edit mode to switch to a different Part. However, you should store all edited Mixing Voices before choosing another Song or changing to a different mode.

SONGS IN THE S70/90 XS

The procedures described above can be basically performed in the MOTIF XS/XF and in the MOX/MOXF. There are only small deviations between the MOTIF and MOX series, which are merely due to the different user interface. As already mentioned, there is no sequencer in the S-series that allows a Pattern or Song oriented recording. But, for years now you get free a version of Cubase AI to each instrument from Yamaha's series of synthesizers. Due to the excellent integration of Yamaha instruments with Cubase by using the free Yamaha editors, you can use the S70/90 XS to produce Songs, too. After installing the drivers and software on a Mac or PC, you can connect the instrument via USB to your computer to establish MIDI connections in both directions. The S70/90 XS replaces the Song and Pattern Mixings of the MOTIF series (64 memories each) with 128 Multis. Use the editor to select the Voices you want to use in your Multi. Each Voice is given a separate MIDI channel and a corresponding Track in Cubase. This sets you in a position to work out your recording in principle as described above. With the difference that the sound generation takes place in the instrument and the sequencer is available as software on the computer.

It is also possible to start a Song production with a Performance as the starting point on the S70/90 XS. In the Music Production Guides 12-2010 to 02-2011 a three-part workshop describes the Song production using Arpeggios in conjunction with Cubase. For the playback of Songs created in this kind of way, the S70/90 XS offers the so-called Sequence Play mode. Beyond the simple playback function a comprehensive „Chain" features 100 steps to bring commands in a useful order, which corresponds to the timing of the planned performance. These steps load Multis, their corresponding Songs, or execute control commands. Even audio files can be integrated and played in the chain.

SUMMARY

This ninth part of the Yamaha Synth Guide completes this series. With an instrument of the MOTIF family you have a versatile workstation with almost limitless potential for creativity at your hands. Whether you prefer to work exclusively on the instrument or in conjunction with a computer - anything is possible. Those who prefer sonic experiments have the possibility - again with or without software support - to use the synthesizer and its high-resolution parametrics as a powerful tool for creative sound design.

We hope that we have succeeded to cover the most important features with the Yamaha Synth Guide. We were trying to keep a balance between a manageable scope and detail. Soon all nine parts are summarized in a complete Yamaha Synth Guide that will be available as a single PDF. We will let you know in the next Music Production Guide and provide the download link. For questions and comments about the Yamaha Synth Guide we have set up an e-mail address:

ysg@hape13.de

We look forward to your feedback and remain yours

Peter Krischker & Hans-Peter Henkel

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